

TruePosition Indoor Test Report Wilmington, DE

Appendix A: Performance Results Per Test Point

March 22, 2013

Prepared By:

TechnoCom

Table of Contents

APPENDIX A: PERFORMANCE RESULTS PER TEST POINT	1
1 URBAN BUILDINGS	1
1.1 BUILDING 3:	1
1.1.1 Building 3 Environment:	1
1.1.2 Building 3 Test Points:	2
1.1.3 Building 3 Test Results:	3
1.2 BUILDING 5:	7
1.2.1 Building 5 Environment:	7
1.2.2 Building 5 Test Points:	8
1.2.3 Building 5 Test Results:	9
1.3 BUILDING 6:	13
1.3.1 Building 6 Environment:	13
1.3.2 Building 6 Test Points:	14
1.3.3 Building 6 Test Results:	15
1.4 BUILDING 7:	20
1.4.1 Building 7 Environment:	20
1.4.2 Building 7 Test Points:	21
1.4.3 Building 7 Test Results:	22
1.5 BUILDING 9:	26
1.5.1 Building 9 Environment:	26
1.5.2 Building 9 Test Points:	27
1.5.3 Building 9 Test Results:	28
2 SUBURBAN BUILDINGS	32
2.1 BUILDING 1:	32
2.1.1 Building 1 Environment:	32
2.1.2 Building 1 Test Points:	33
2.1.3 Building 1 Test Results:	34
2.2 BUILDING 2:	37
2.2.1 Building 2 Environment:	37
2.2.2 Building 2 Test Points:	38
2.2.3 Building 2 Test Results:	39
2.3 BUILDING 4:	43
2.3.1 Building 4 Environment:	43
2.3.2 Building 4 Test Points:	44
2.3.3 Building 4 Test Results:	45
2.4 BUILDING 8:	49

2.4.1	Building 8 Environment:.....	49
2.4.2	Building 8 Test Points:.....	50
2.4.3	Building 8 Test Results:.....	51
2.5	BUILDING 10:	55
2.5.1	Building 10 Environment:.....	55
2.5.2	Building 10 Test Points:.....	56
2.5.3	Building 10 Test Results:	57

Appendix A: Performance Results per Test Point

1 Urban Buildings

1.1 Building 3:

1.1.1 Building 3 Environment:

Building 3 is the DoubleTree Hotel located at 700 N. King Street, Wilmington, DE. It is a 9 story concrete and glass building with an attached two story structure to its east and an attached 3 story parking structure to its west. The other building in the background is the Wilmington courthouse across 8th Street.



Building 3 is in the urban part of the City of Wilmington, and as seen in the Google Earth aerial view, it is surrounded by other buildings of varying heights in all directions.



1.1.2 Building 3 Test Points:

TP1: Lower level entrance to the parking lot, approximately in the middle of the building

TP2: 1st floor, back end of the hotel by meeting rooms

TP3: 1st floor pool area inside the 2 story attached building—open area with ceiling at about 30 feet

TP4: 7th floor corridor

TP5: 8th floor guest room

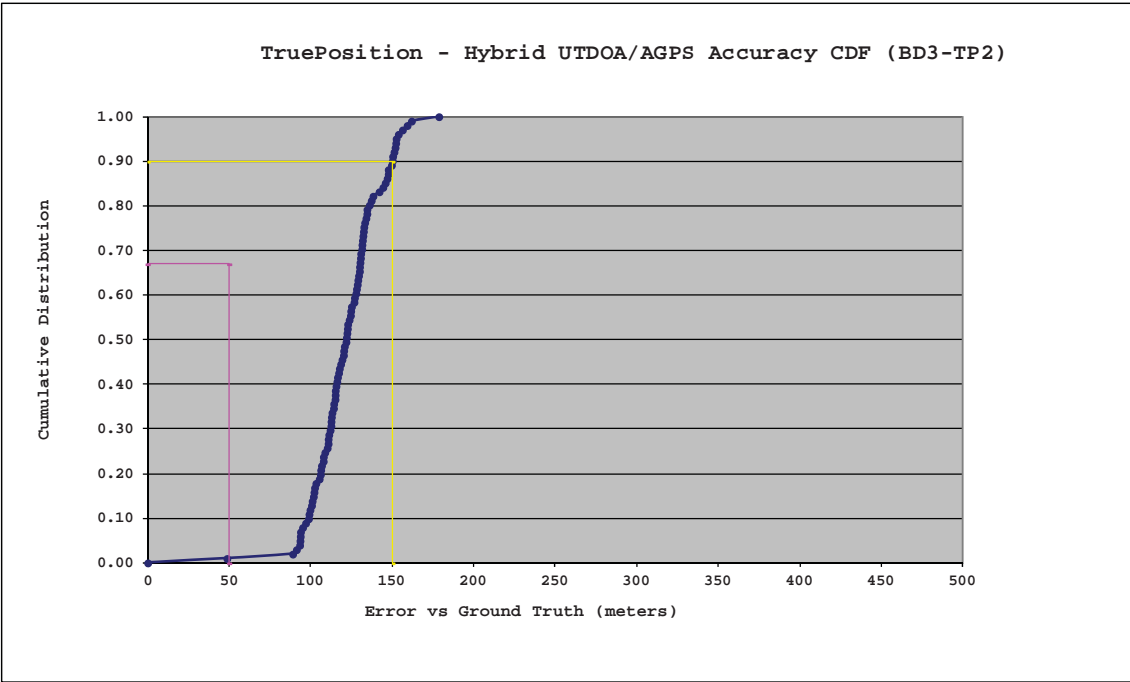
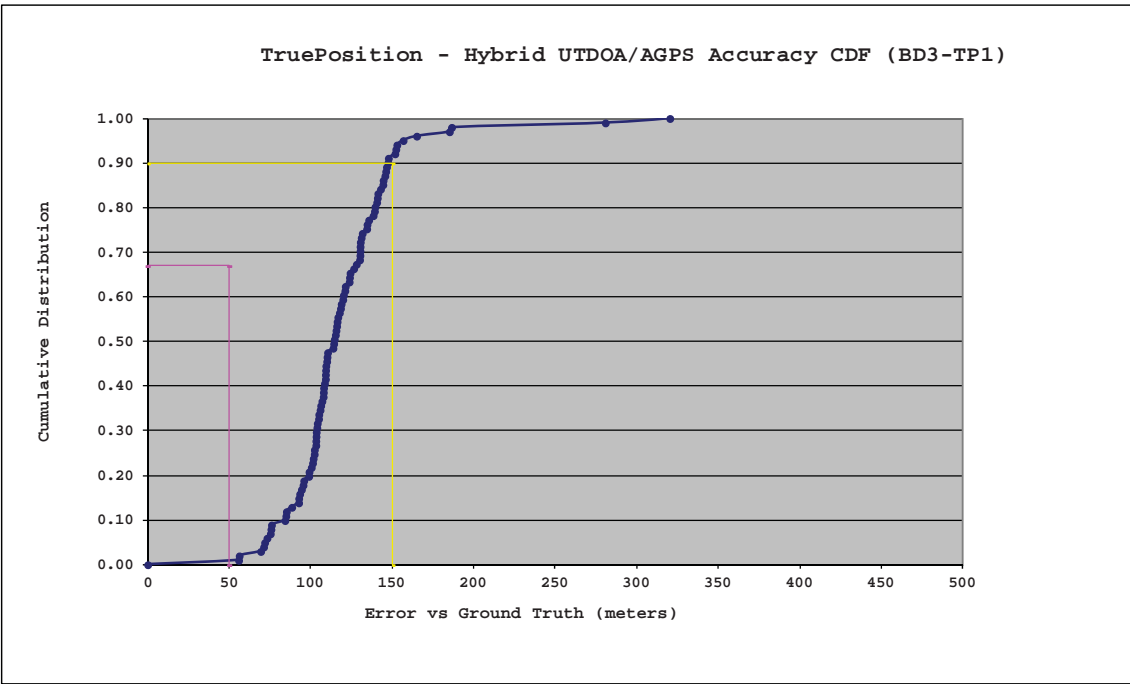
1.1.3 Building 3 Test Results:

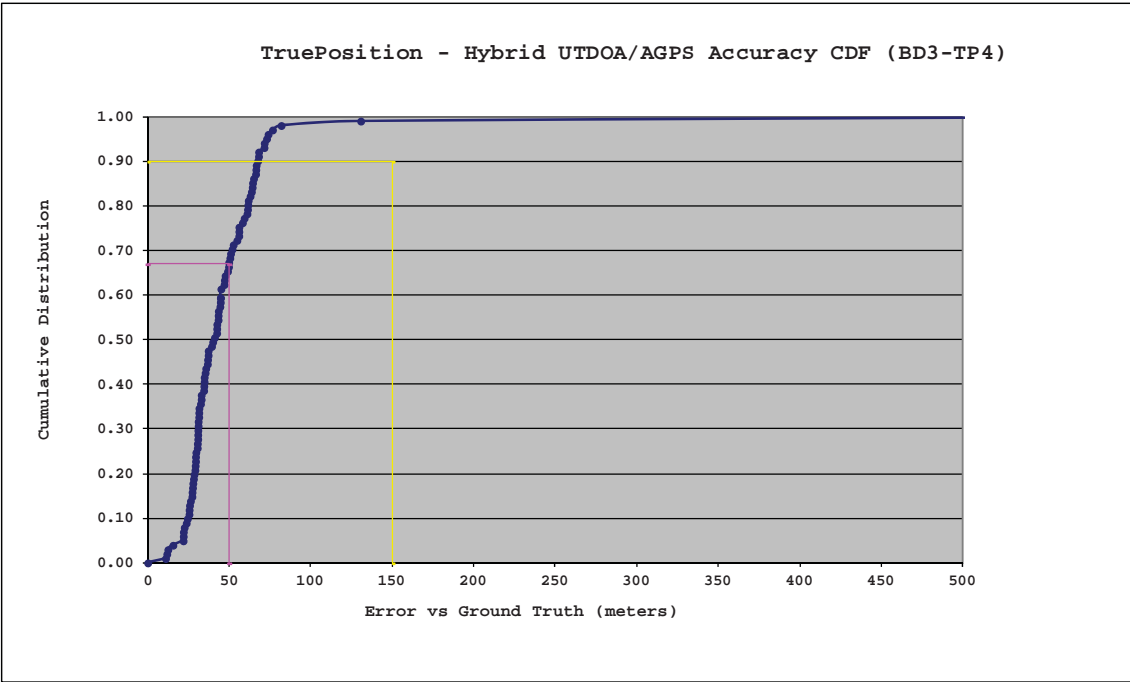
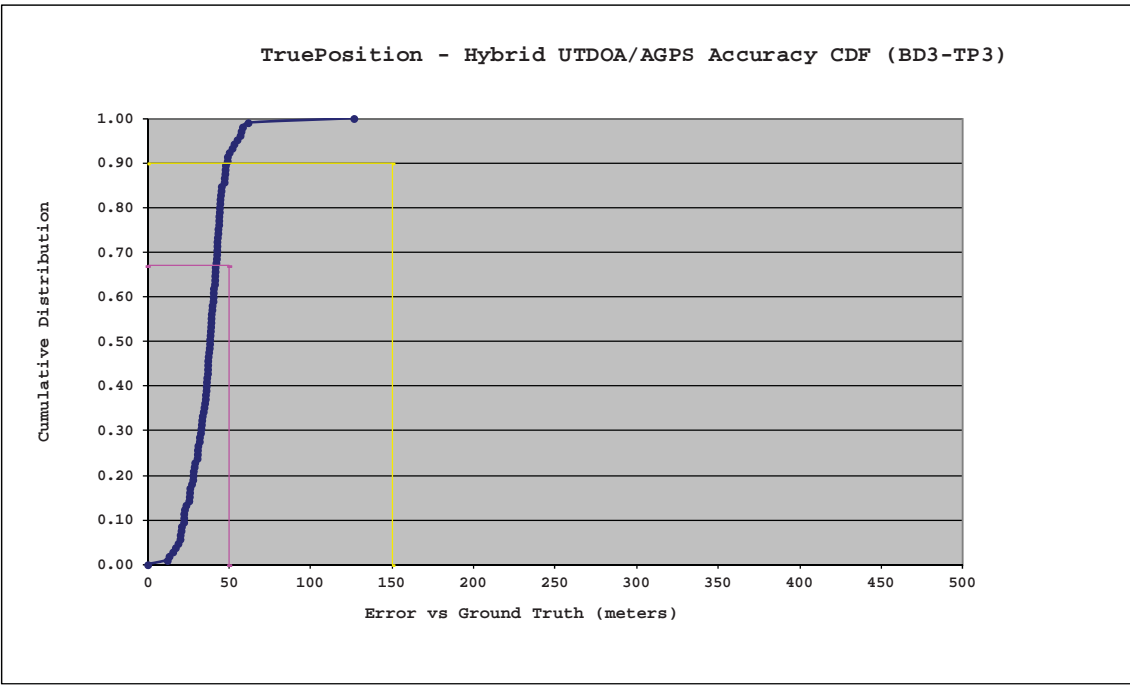
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD3_TP1	101	101	100.0%
TruePosition_BD3_TP2	101	101	100.0%
TruePosition_BD3_TP3	105	105	100.0%
TruePosition_BD3_TP4	101	101	100.0%
TruePosition_BD3_TP5	101	101	100.0%

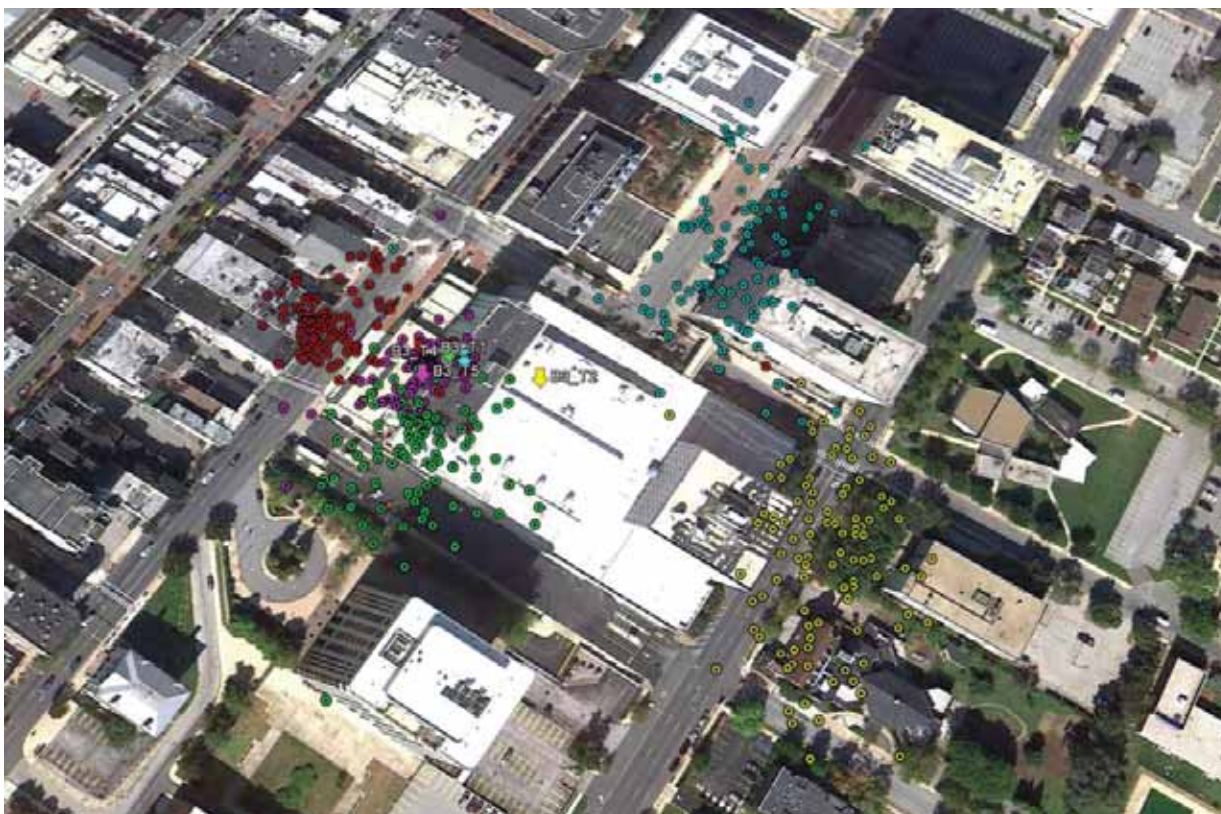
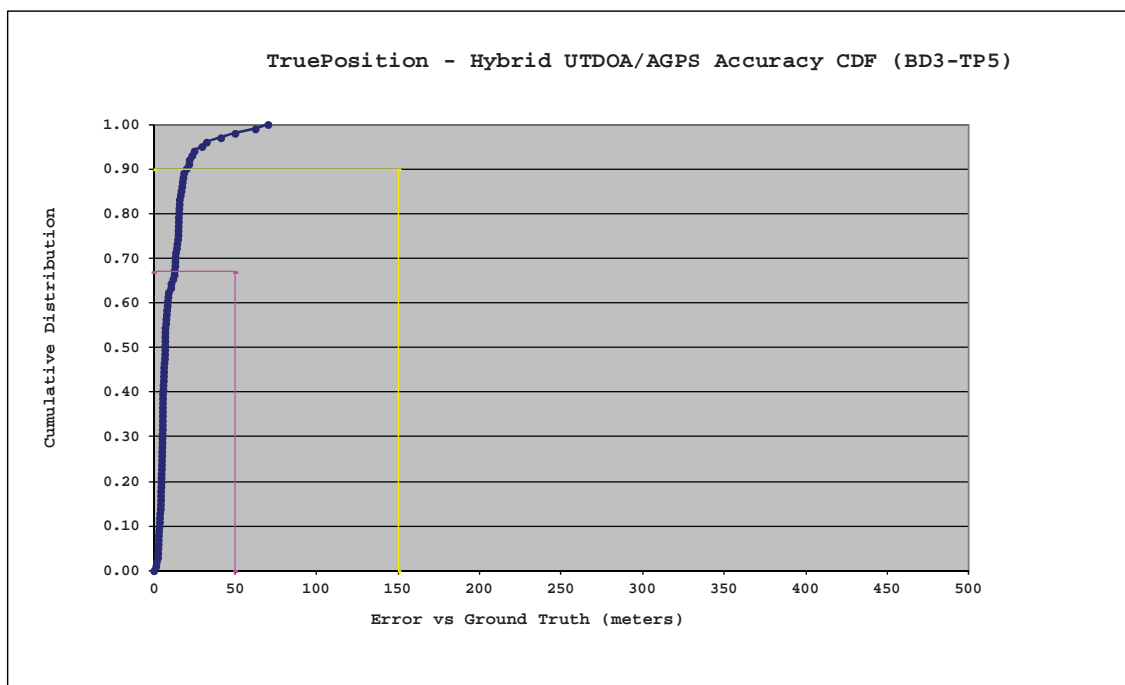
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD3_TP1	101	127.9	147.3	156.6	119.2	36.0	320.1	55.74
TruePosition_BD3_TP2	101	130.2	150.0	152.3	122.2	19.8	178.5	48.56
TruePosition_BD3_TP3	105	41.7	48.3	54.4	37.6	13.3	126.4	12.01
TruePosition_BD3_TP4	101	49.7	67.5	72.9	49.7	65.0	669.6	10.93
TruePosition_BD3_TP5	101	12.6	20.0	29.5	11.1	11.3	70.0	1.26

UTDOA TTFF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD3_TP1	4.95	0.22	5.00	4.00
TruePosition_BD3_TP2	4.92	0.27	5.00	4.00
TruePosition_BD3_TP3	5.00	0.14	6.00	4.00
TruePosition_BD3_TP4	4.87	0.34	5.00	4.00
TruePosition_BD3_TP5	4.84	0.37	5.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with Error < Uncertainty	Percentage of calls Error < Uncertainty
TruePosition_BD3_TP1	101	25	24.75%
TruePosition_BD3_TP2	101	16	15.84%
TruePosition_BD3_TP3	105	72	68.57%
TruePosition_BD3_TP4	101	97	96.04%
TruePosition_BD3_TP5	101	99	98.02%







Building 3- Hybrid UTD OA-AGPS Location Scatter

1.2 Building 5:

1.2.1 Building 5 Environment:

Building 5 known as “500 Delaware” building at 500 Delaware Ave., Wilmington, DE. It is a 15 story glass office building surrounded by other tall office buildings.



As seen in the Google Earth aerial view, Building 5 is in the core of the urban part of the City of Wilmington, surrounded by other large buildings in most directions.



1.2.2 Building 5 Test Points:

TP1: 9th floor toward Suite 910, Stair Case 1

TP2: 7th floor office facing Delaware Ave

TP3: 3rd floor corner office with windows on two sides

TP4: 2nd floor elevator lobby

TP5: 1st floor, corridor to loading dock by generator room

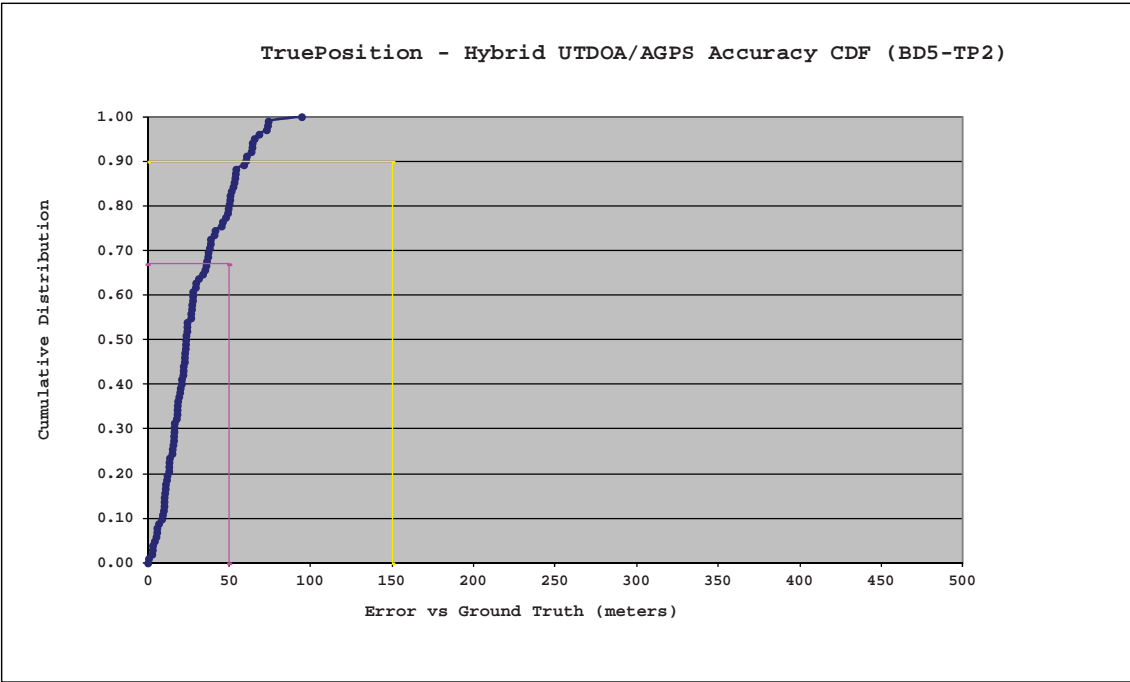
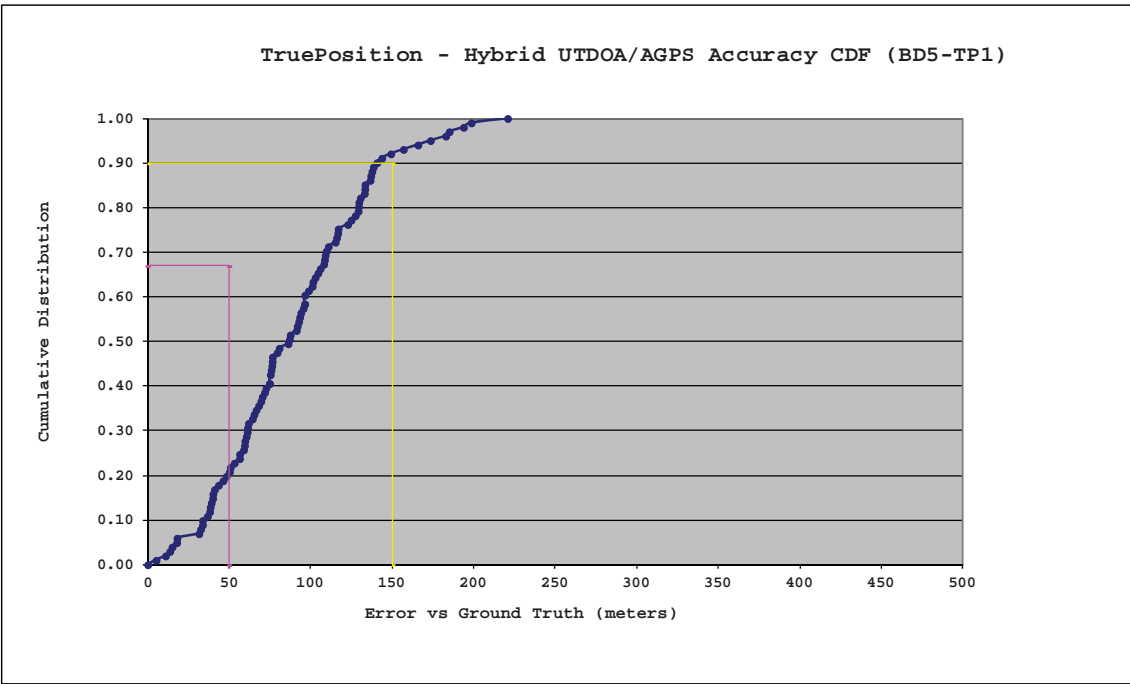
1.2.3 Building 5 Test Results:

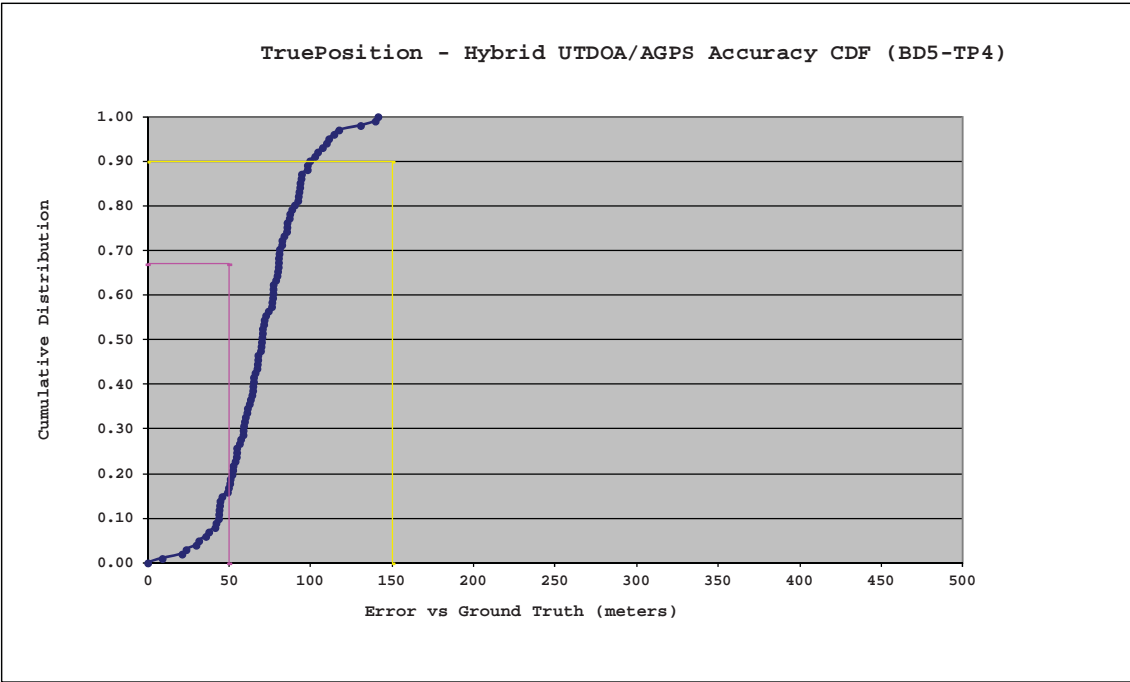
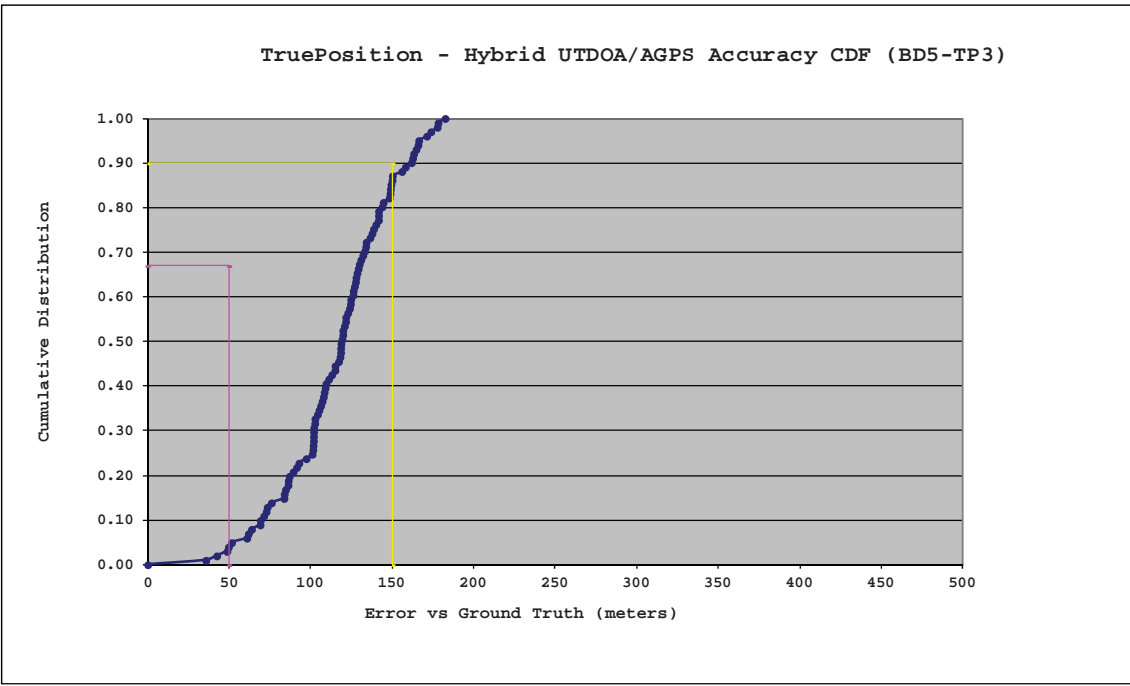
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD5_TP1	101	101	100.0%
TruePosition_BD5_TP2	102	102	100.0%
TruePosition_BD5_TP3	101	101	100.0%
TruePosition_BD5_TP4	101	101	100.0%
TruePosition_BD5_TP5	101	101	100.0%

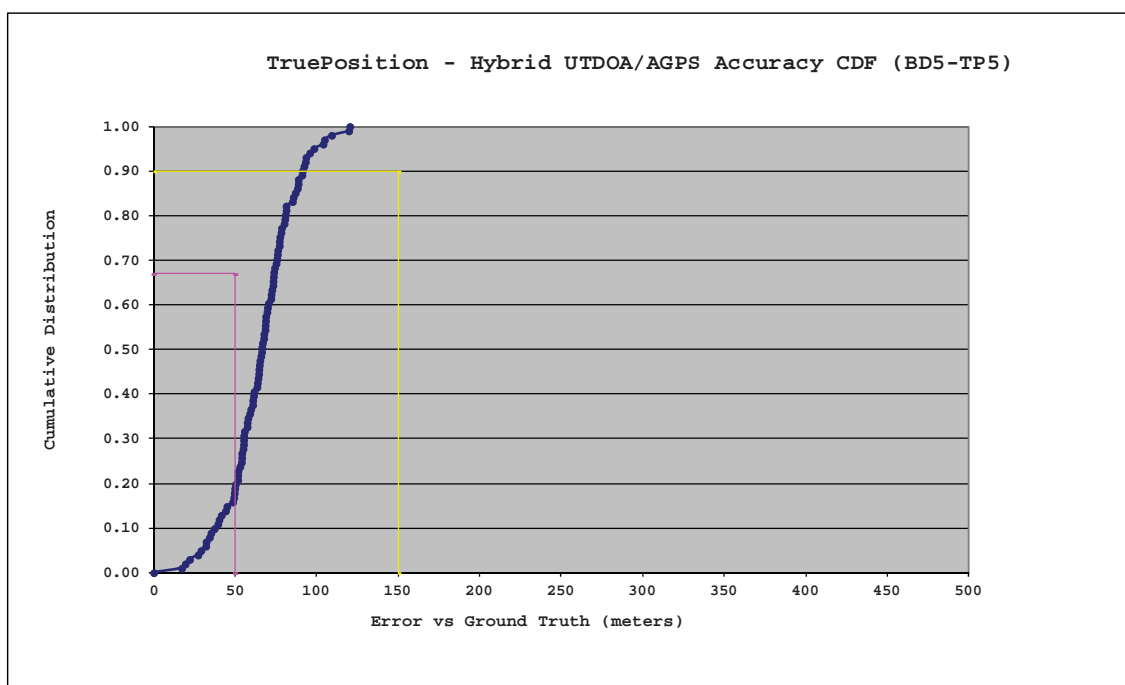
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD5_TP1	101	107.9	140.6	173.3	89.4	45.2	220.7	5.10
TruePosition_BD5_TP2	102	36.0	60.1	65.3	29.7	20.0	94.3	0.50
TruePosition_BD5_TP3	101	129.7	161.7	166.2	116.7	32.6	182.4	35.64
TruePosition_BD5_TP4	101	80.2	99.4	111.0	71.4	24.2	141.2	8.87
TruePosition_BD5_TP5	101	73.6	91.3	98.2	66.0	20.6	120.2	17.14

UTDOA TTFF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD5_TP1	3.00	0.47	5.00	2.00
TruePosition_BD5_TP2	4.82	0.38	5.00	4.00
TruePosition_BD5_TP3	4.85	0.46	7.00	3.00
TruePosition_BD5_TP4	4.88	0.33	5.00	4.00
TruePosition_BD5_TP5	5.00	0.00	5.00	5.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with Error < Uncertainty	Percentage of calls Error < Uncertainty
TruePosition_BD5_TP1	101	88	87.13%
TruePosition_BD5_TP2	102	101	99.02%
TruePosition_BD5_TP3	101	49	48.51%
TruePosition_BD5_TP4	101	89	88.12%
TruePosition_BD5_TP5	101	57	56.44%







Building 5- Hybrid UTDOA-AGPS Location Scatter

1.3 Building 6:

1.3.1 Building 6 Environment:

Building 6 is the “Nemours” building at 1007 N. Orange in Wilmington, DE. It is a 14 story concrete building covering a full street block. It is surrounded in all directions by office buildings and parking structures.



As seen in the Google Earth aerial view, Building 6 is in the core of the urban part of the City of Wilmington, surrounded by other large buildings in various directions.



1.3.2 Building 6 Test Points:

TP1: 12th floor NE side - corridor outside of empty office

TP2: 10th floor corner office, South side facing 10th street

TP3: 10th floor, Reception desk outside of an office on north side facing 11th Street

TP4: 6th floor Middle office, facing the inner open area of the building

TP5: 6th floor outside IT room across from windows facing West side

TP6: Lobby Level, SE corridor

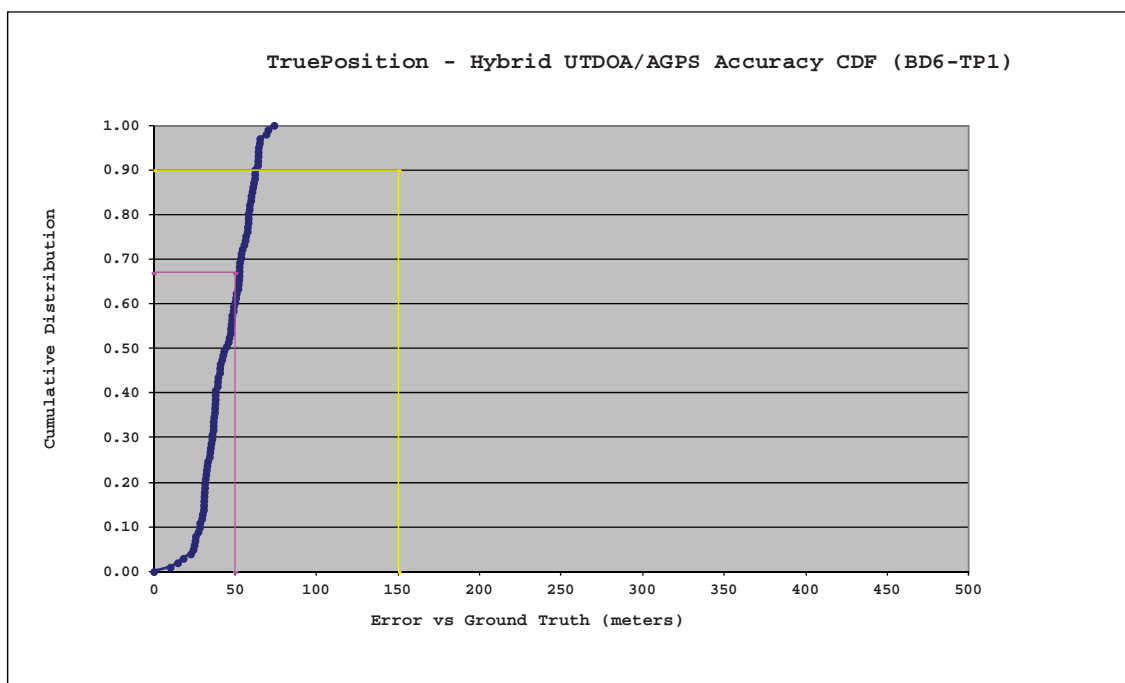
1.3.3 Building 6 Test Results:

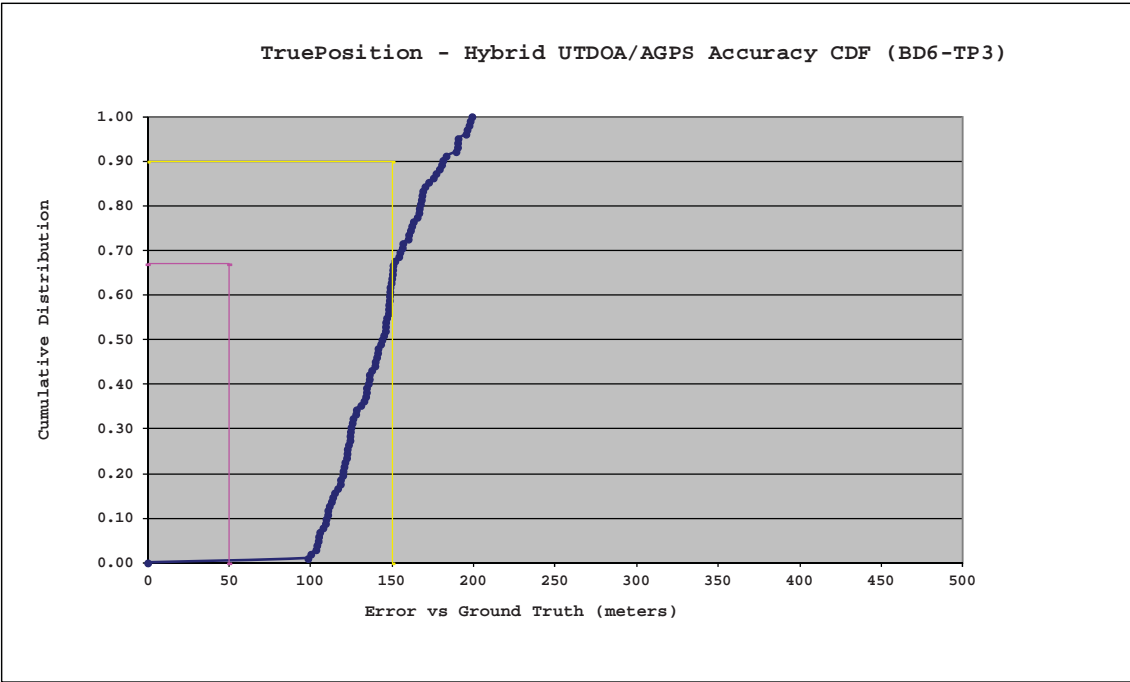
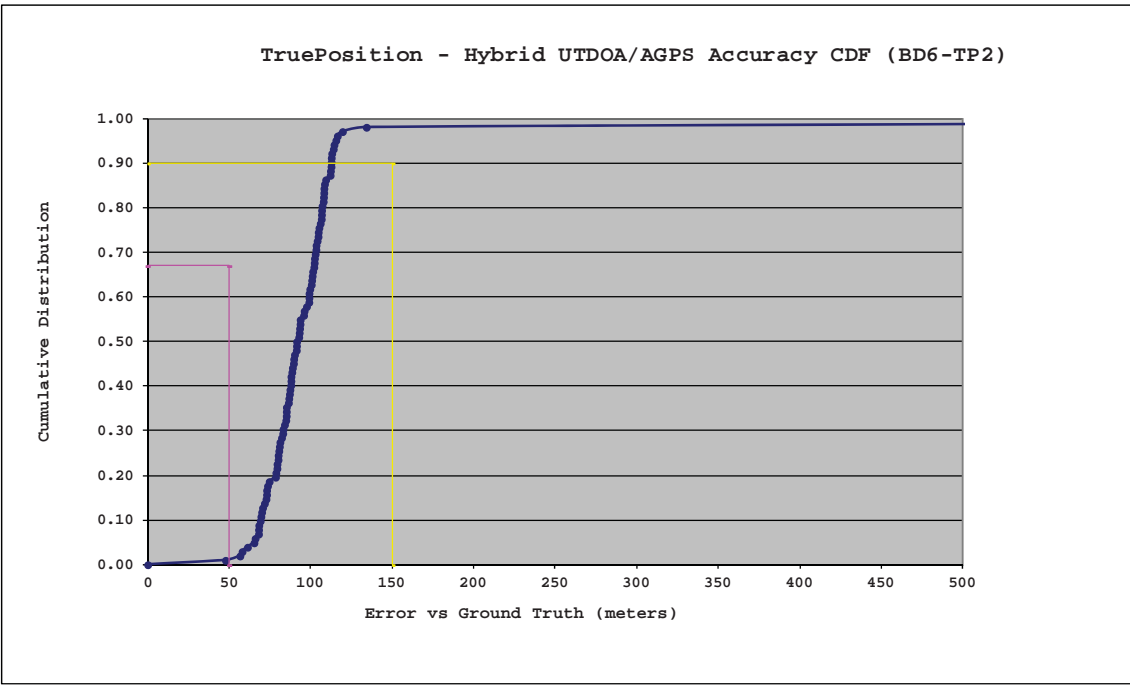
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD6_TP1	101	101	100.0%
TruePosition_BD6_TP2	102	102	100.0%
TruePosition_BD6_TP3	102	102	100.0%
TruePosition_BD6_TP4	102	102	100.0%
TruePosition_BD6_TP5	102	102	100.0%
TruePosition_BD6_TP6	101	101	100.0%

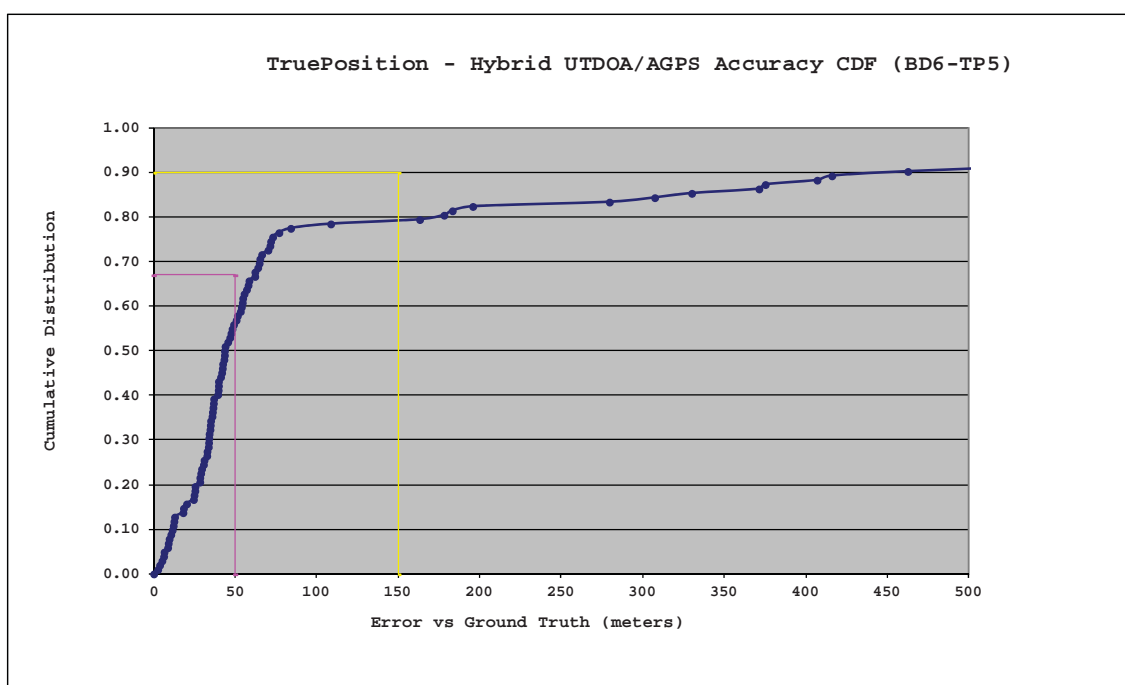
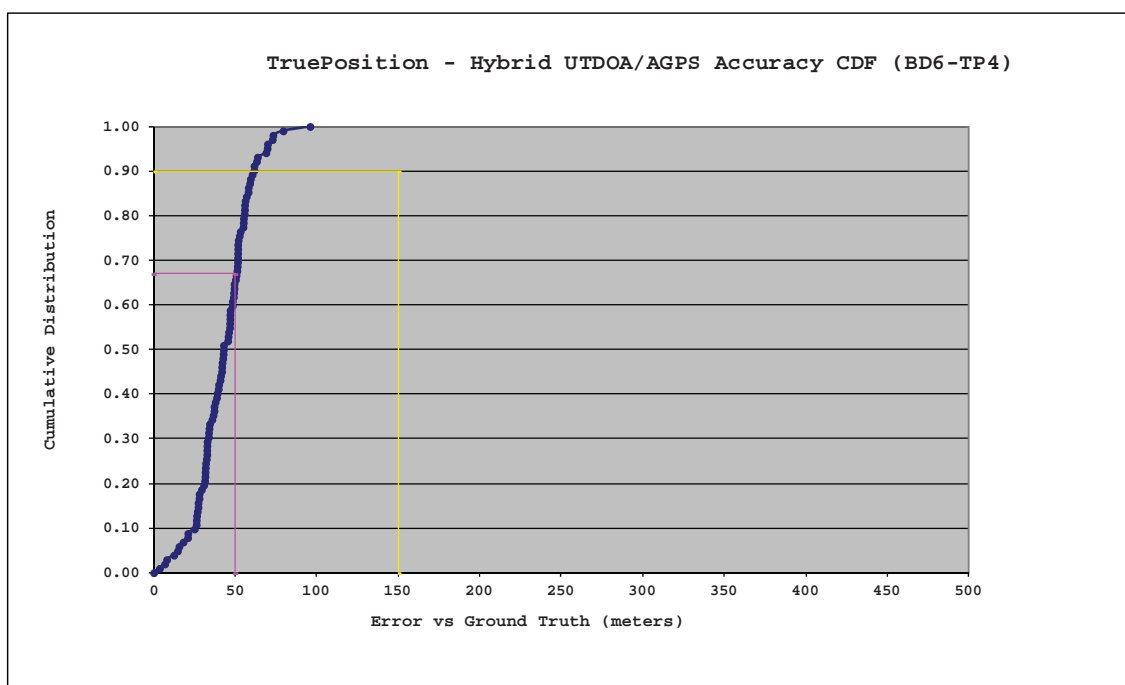
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD6_TP1	101	52.4	62.1	64.2	44.6	13.7	73.7	10.09
TruePosition_BD6_TP2	102	102.0	112.5	115.3	102.5	79.9	655.0	47.70
TruePosition_BD6_TP3	102	151.2	180.9	190.3	143.8	26.2	198.8	98.24
TruePosition_BD6_TP4	102	50.9	61.4	69.5	43.1	16.0	95.8	3.56
TruePosition_BD6_TP5	102	62.0	457.7	684.7	135.2	212.4	936.3	2.48
TruePosition_BD6_TP6	101	95.9	104.5	108.1	85.4	16.7	119.0	40.45

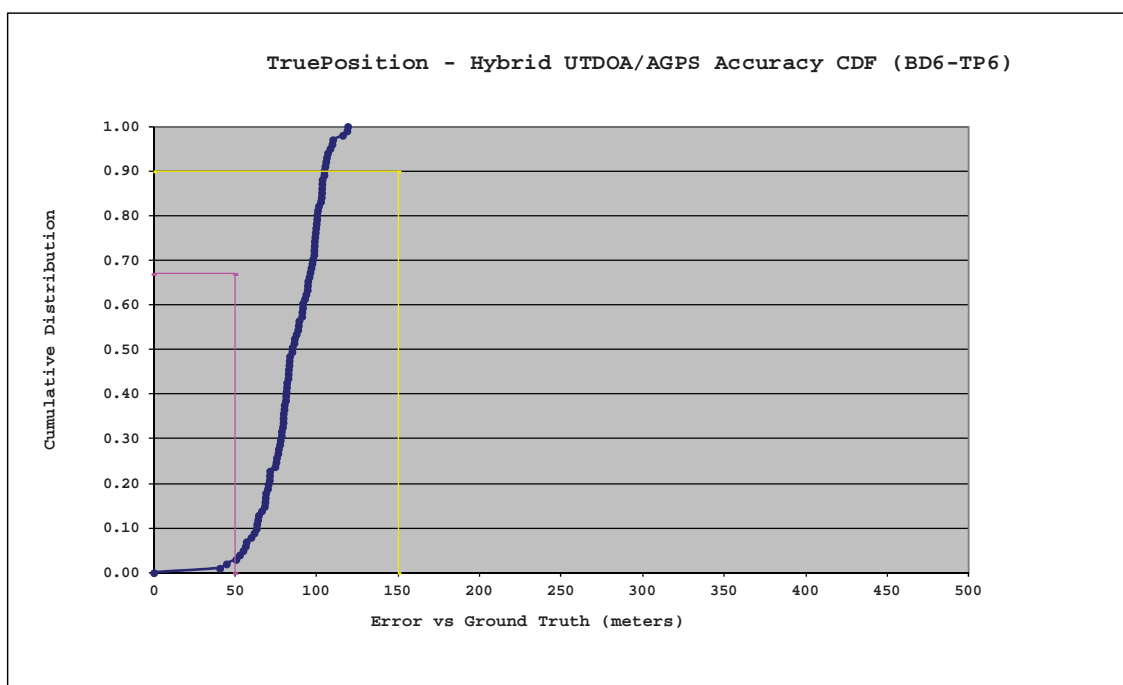
UTDOA TTF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD6_TP1	4.94	0.24	5.00	4.00
TruePosition_BD6_TP2	4.94	0.24	5.00	4.00
TruePosition_BD6_TP3	4.92	0.27	5.00	4.00
TruePosition_BD6_TP4	4.92	0.27	5.00	4.00
TruePosition_BD6_TP5	4.97	0.17	5.00	4.00
TruePosition_BD6_TP6	4.93	0.26	5.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with Error < Uncertainty	Percentage of calls Error < Uncertainty
TruePosition_BD6_TP1	101	101	100.00%
TruePosition_BD6_TP2	102	29	28.43%
TruePosition_BD6_TP3	102	6	5.88%
TruePosition_BD6_TP4	102	101	99.02%
TruePosition_BD6_TP5	102	90	88.24%
TruePosition_BD6_TP6	101	41	40.59%









Building 6- Hybrid UTD OA-AGPS Location Scatter

1.4 Building 7:

1.4.1 Building 7 Environment:

Building 7 is the “Wilmington tower” building at 1105 N. Market Street in Wilmington, DE. It is a 22 story concrete and glass office building. It is the building in the foreground shown below. (The other tall building in the background is across 12th Street.)



As seen in the Google Earth aerial view, Building 7 is in the core of the urban part of the City of Wilmington, surrounded by other large buildings in various directions.



1.4.2 Building 7 Test Points:

TP1: 11th floor, south side inside office, approximately in the middle of the building

TP2: Entry to NW corner office with window seeing the neighboring building

TP3: 3rd floor, middle of the floor with offices around with windows in three directions

TP4: 3rd floor, Telco room in the SE corner of the floor

TP5: 2nd floor of 2-story annex building, in corridor

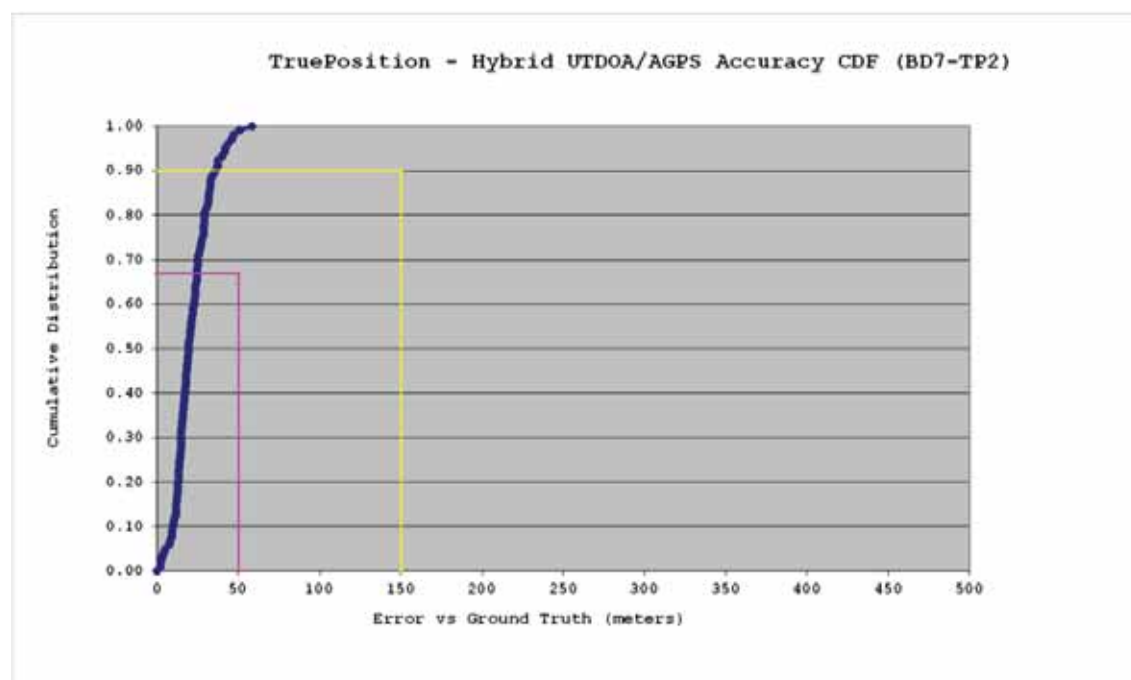
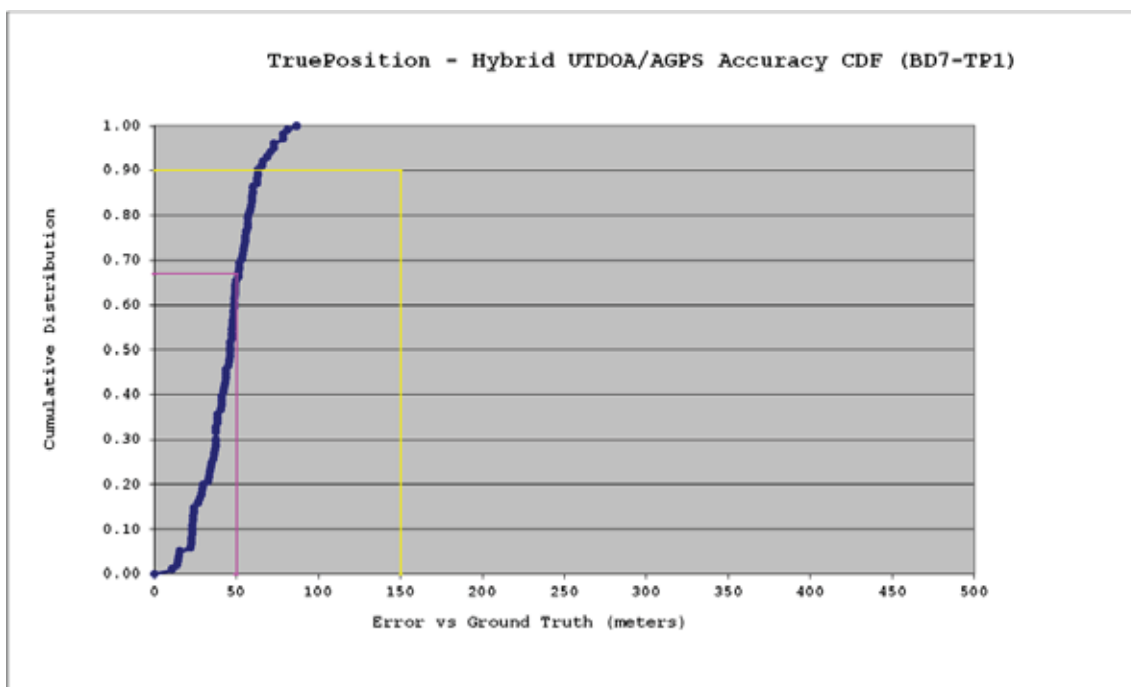
1.4.3 Building 7 Test Results:

Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD7_TP1	101	101	100.0%
TruePosition_BD7_TP2	102	102	100.0%
TruePosition_BD7_TP3	102	102	100.0%
TruePosition_BD7_TP4	102	102	100.0%
TruePosition_BD7_TP5	103	103	100.0%

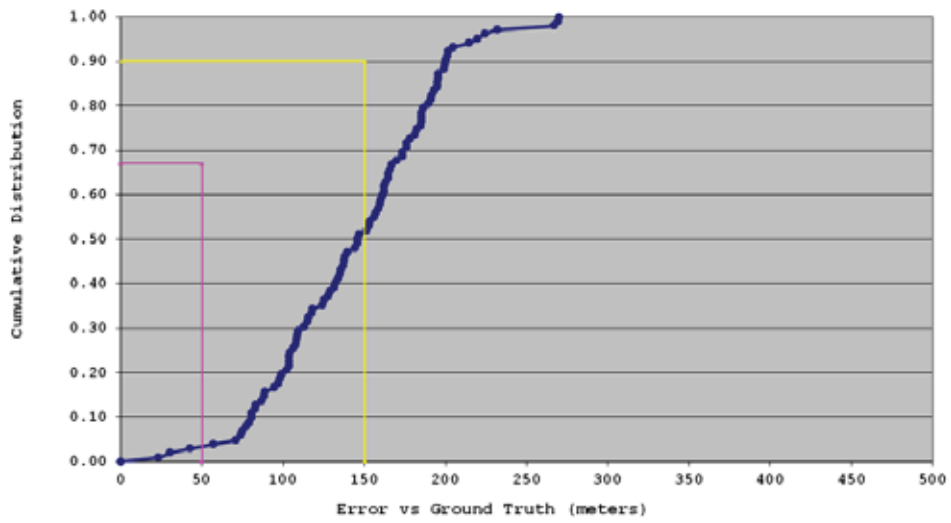
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD7_TP1	101	51.7	63.1	72.8	45.4	15.9	87.0	11.09
TruePosition_BD7_TP2	102	24.9	36.6	42.3	21.9	10.9	58.6	2.35
TruePosition_BD7_TP3	102	168.9	200.3	219.3	145.2	50.2	269.9	23.22
TruePosition_BD7_TP4	102	145.7	168.8	191.1	132.5	36.2	227.2	23.21
TruePosition_BD7_TP5	103	96.9	139.1	152.3	79.9	47.2	267.2	19.15

UTDOA TTFF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD7_TP1	4.93	0.26	5.00	4.00
TruePosition_BD7_TP2	4.88	0.32	5.00	4.00
TruePosition_BD7_TP3	4.61	0.51	6.00	4.00
TruePosition_BD7_TP4	4.86	0.35	5.00	4.00
TruePosition_BD7_TP5	4.74	0.44	5.00	4.00

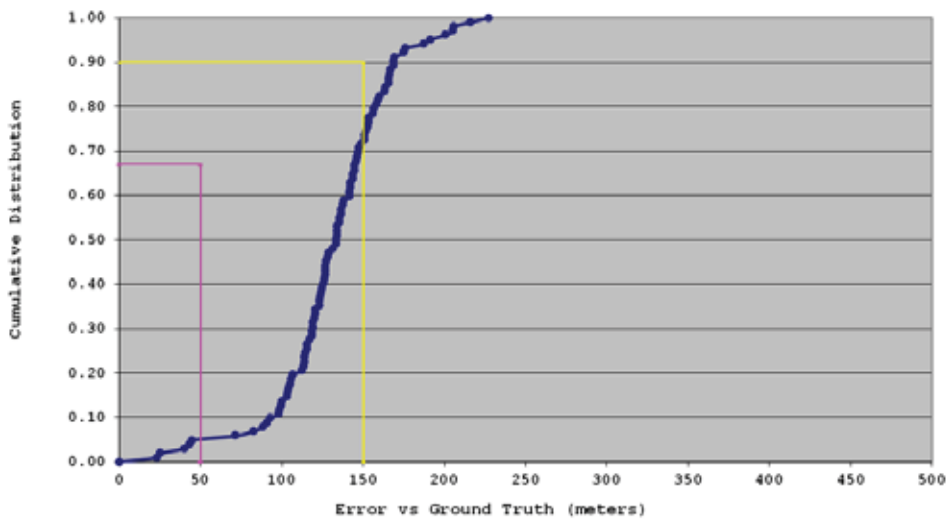
UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with Error < Uncertainty	Percentage of calls Error < Uncertainty
TruePosition_BD7_TP1	101	101	100.00%
TruePosition_BD7_TP2	102	102	100.00%
TruePosition_BD7_TP3	102	35	34.31%
TruePosition_BD7_TP4	102	24	23.53%
TruePosition_BD7_TP5	103	64	62.14%

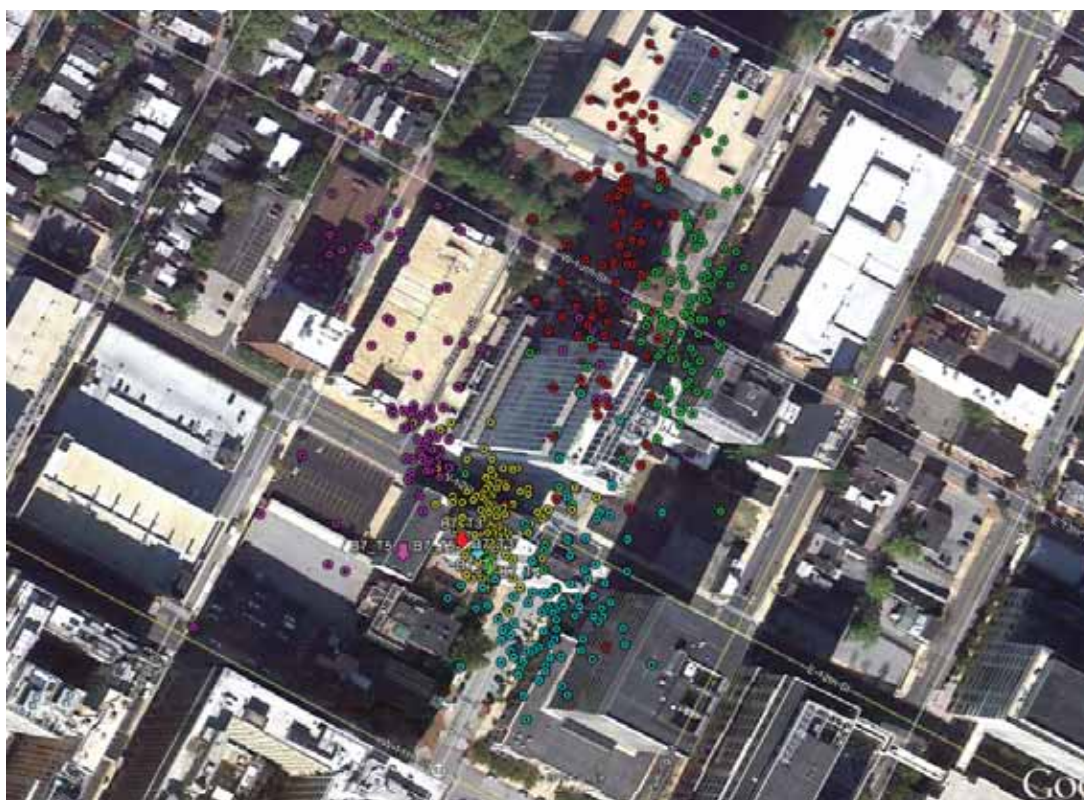
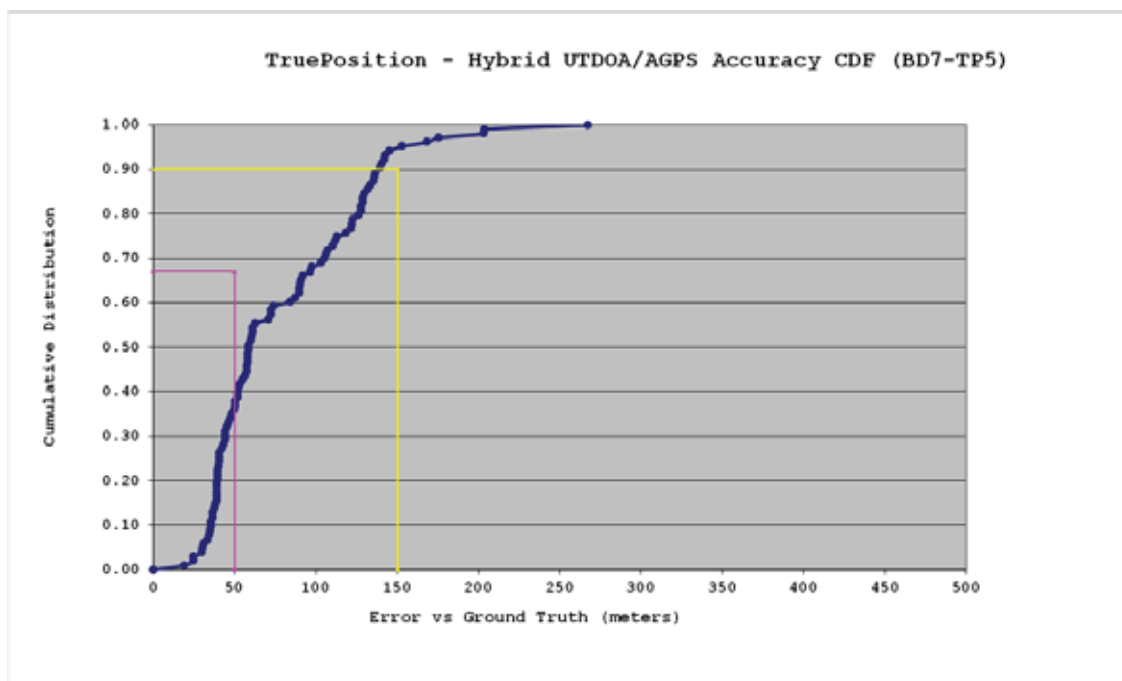


TruePosition - Hybrid UTDOA/AGPS Accuracy CDF (BD7-TP3)



TruePosition - Hybrid UTDOA/AGPS Accuracy CDF (BD7-TP4)





Building 7- Hybrid UTDOA-AGPS Location Scatter

1.5 Building 9:

1.5.1 Building 9 Environment:

Building 9 is the “233 King St.” building at 233 N. King Street in Wilmington, DE. It is a 4 story brick corner office building attached in two sides by similar structures.



As seen in the Google Earth aerial view, Building 9 is in the somewhat lighter urban part of the City of Wilmington, surrounded by other similar sized buildings. However, not too far across the street, taller structures are seen. Those can play a key role affecting location system performance.



1.5.2 Building 9 Test Points:

TP1: 1st floor main lobby

TP2: 3rd floor front staircase

TP3: 3rd floor- Inside break room

TP4: 4th floor by conference room, middle of the floor

TP5: 2nd floor lobby

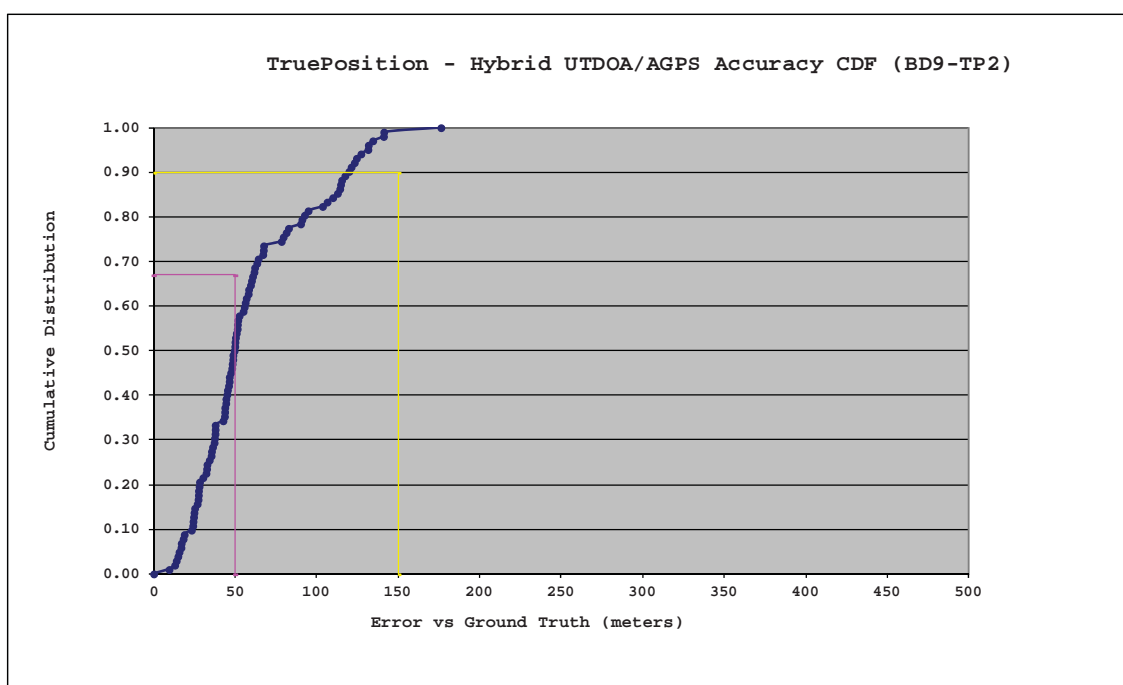
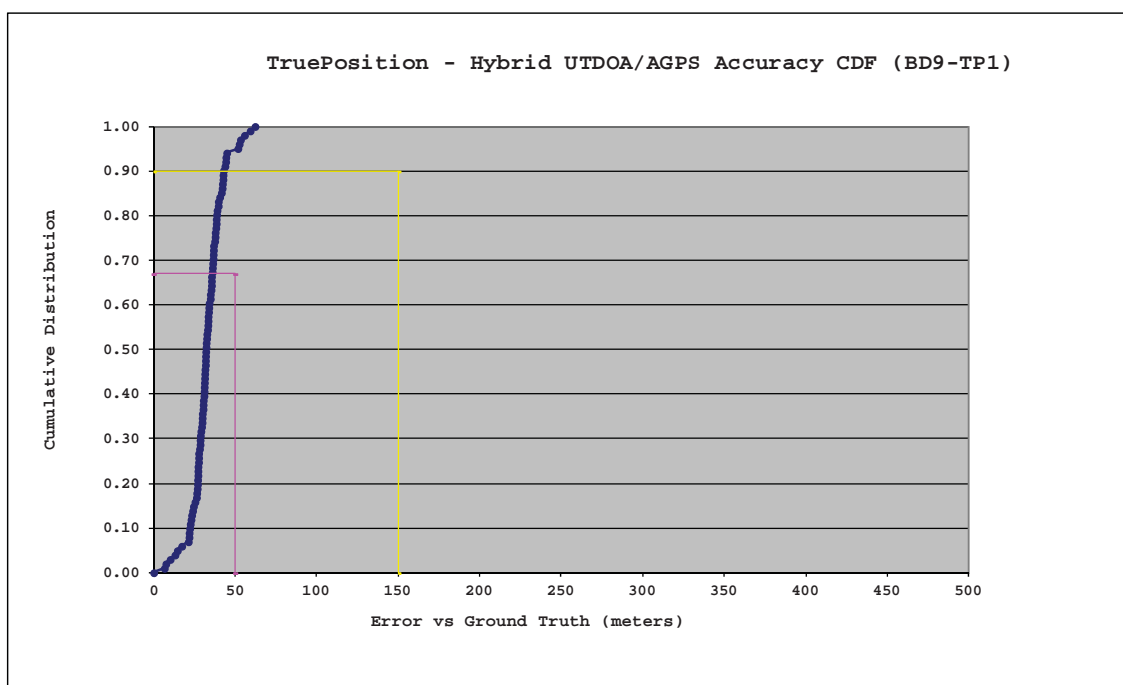
1.5.3 Building 9 Test Results:

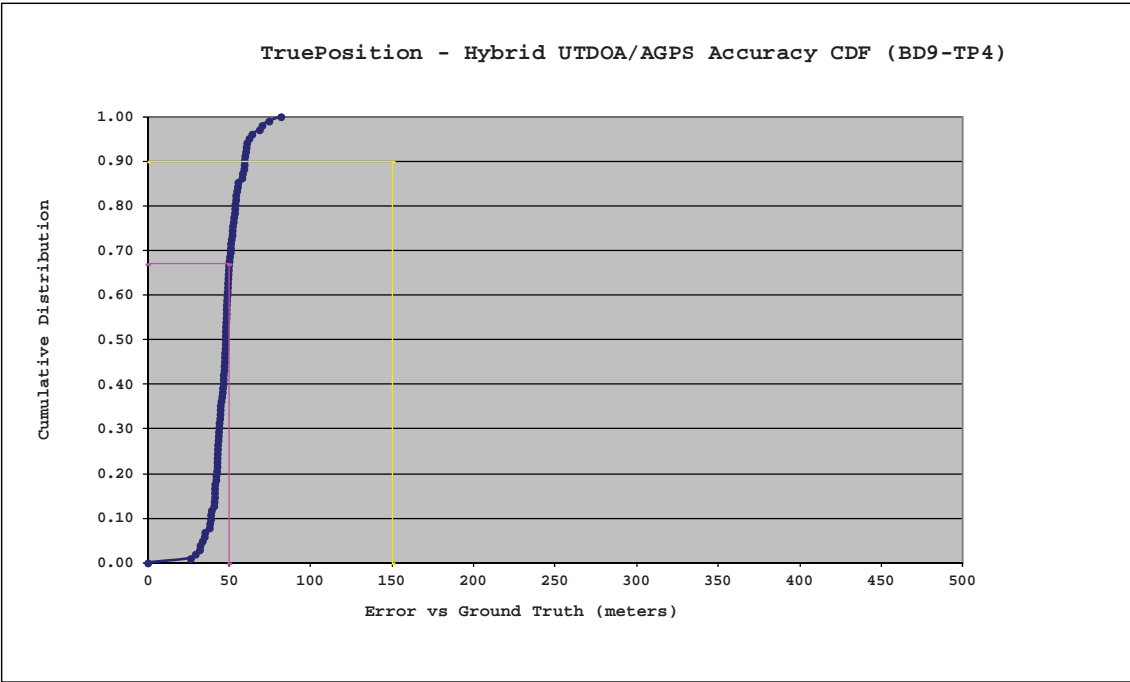
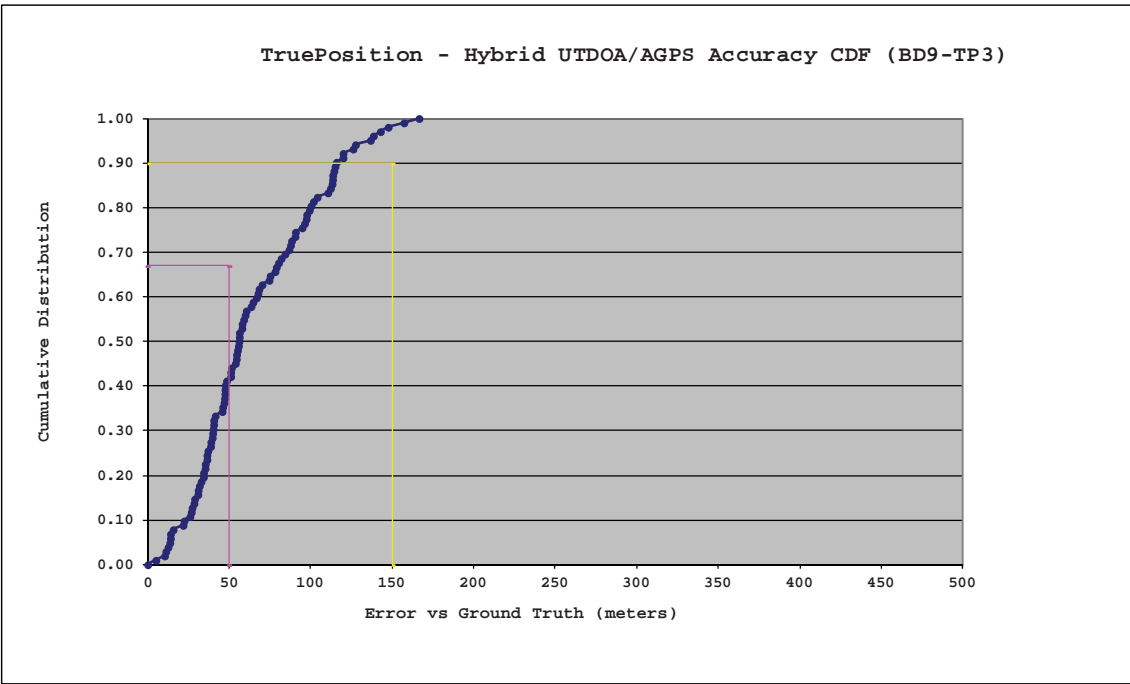
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD9_TP1	101	101	100.0%
TruePosition_BD9_TP2	102	102	100.0%
TruePosition_BD9_TP3	102	102	100.0%
TruePosition_BD9_TP4	102	102	100.0%
TruePosition_BD9_TP5	102	102	100.0%

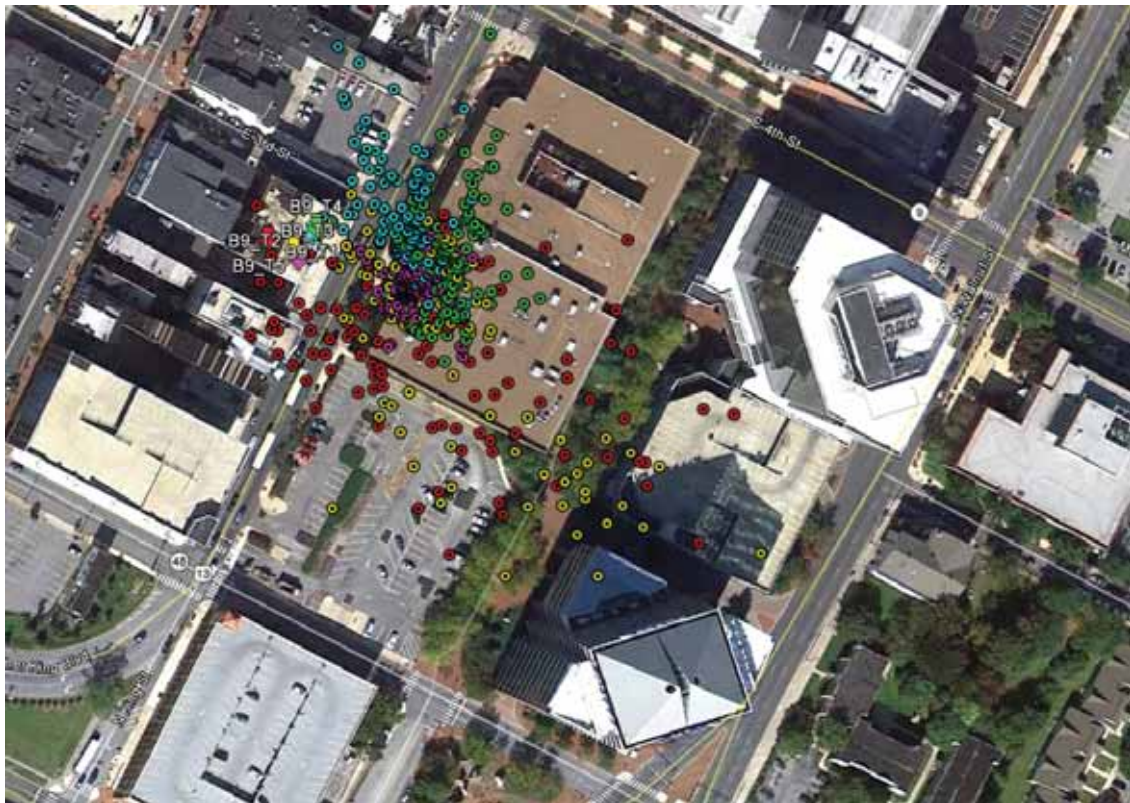
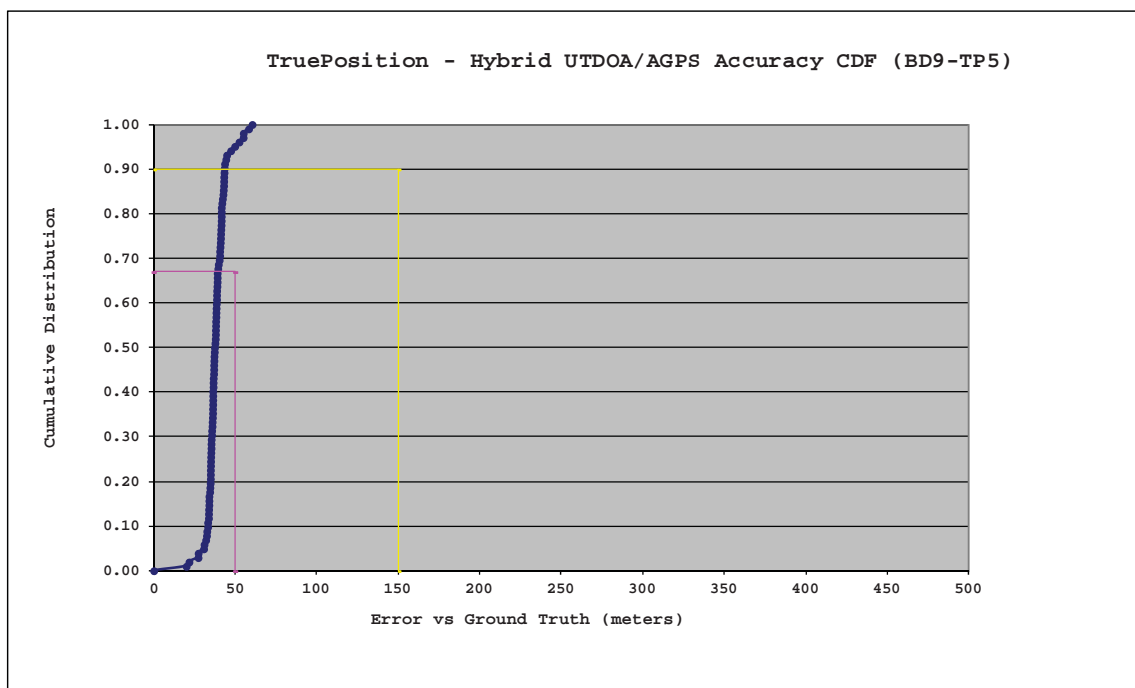
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD9_TP1	101	35.9	42.8	51.6	32.8	9.6	62.1	6.54
TruePosition_BD9_TP2	102	61.2	119.5	131.2	60.0	36.5	176.1	9.43
TruePosition_BD9_TP3	102	79.8	115.7	136.1	65.8	37.4	166.4	5.00
TruePosition_BD9_TP4	102	49.8	59.2	62.0	48.2	8.9	81.6	26.25
TruePosition_BD9_TP5	102	39.2	43.3	49.6	38.2	6.1	60.3	19.92

UTDOA TTF (Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD9_TP1	4.87	0.34	5.00	4.00
TruePosition_BD9_TP2	4.69	2.29	27.00	4.00
TruePosition_BD9_TP3	4.52	0.50	5.00	4.00
TruePosition_BD9_TP4	4.69	0.49	6.00	4.00
TruePosition_BD9_TP5	4.53	0.50	5.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with	Percentage of calls Error < Uncertainty
		Error < Uncertainty	
TruePosition_BD9_TP1	101	12	11.88%
TruePosition_BD9_TP2	102	70	68.63%
TruePosition_BD9_TP3	102	66	64.71%
TruePosition_BD9_TP4	102	5	4.90%
TruePosition_BD9_TP5	102	10	9.80%







Building 9- Hybrid UTDOA-AGPS Location Scatter

2 Suburban Buildings

2.1 Building 1:

2.1.1 Building 1 Environment:

Building 1 is a two story townhouse converted to office space. It is located at 5215 W. Wood mill Drive, Suite 38, in Wilmington, DE.



As seen in the Google Earth aerial view, Building 1 is in the suburban area of Wilmington neighboring townhouses and single family homes.



2.1.2 Building 1 Test Points:

TP1: 1stth floor, inside office

TP2: Basement, middle of the floor

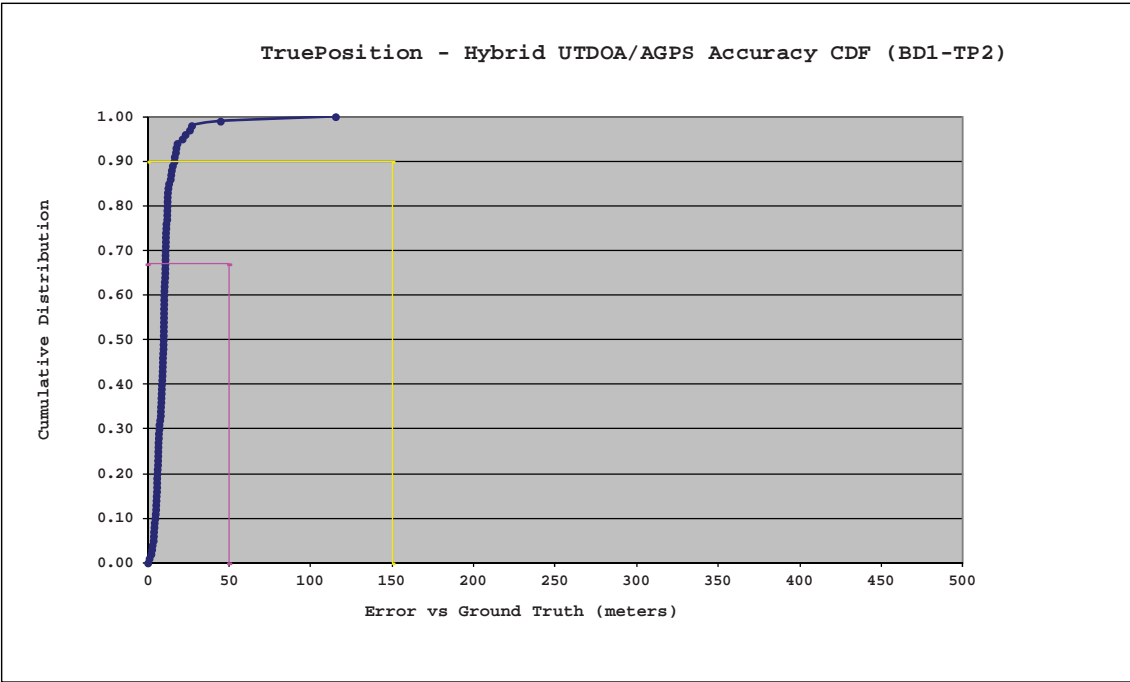
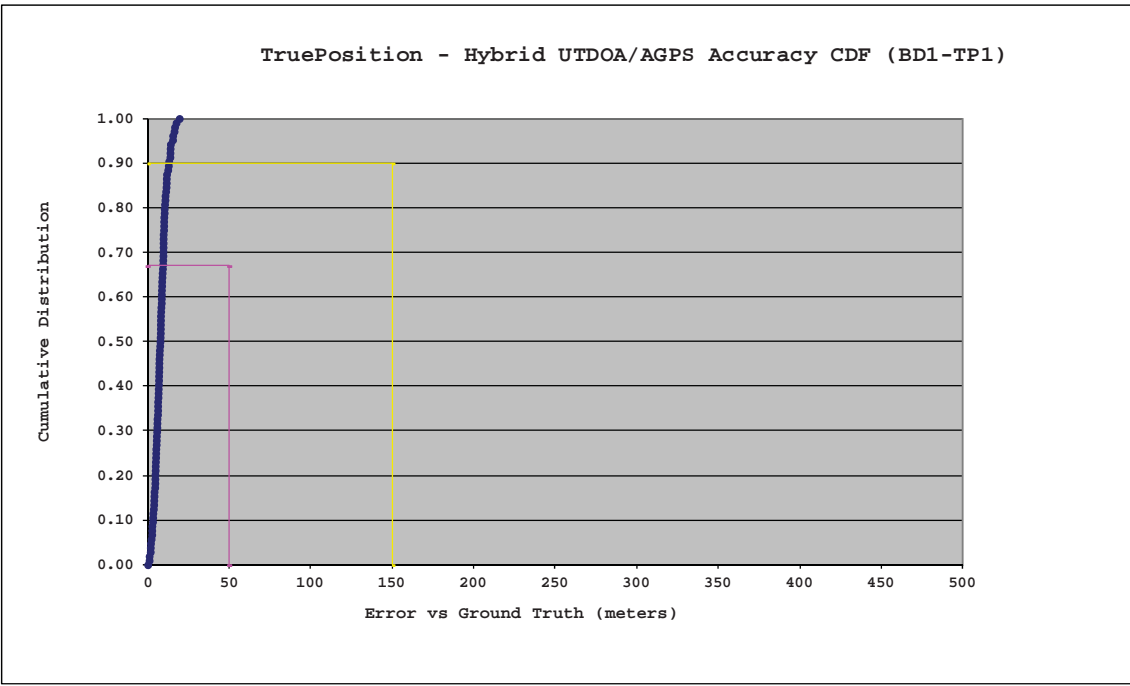
2.1.3 Building 1 Test Results:

Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD1_TP1	104	104	100.0%
TruePosition_BD1_TP2	100	100	100.0%

UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD1_TP1	104	9.2	12.8	15.0	7.8	3.8	19.4	0.87
TruePosition_BD1_TP2	100	10.6	16.2	21.2	10.9	12.0	115.1	0.87

UTDOA TTFF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD1_TP1	4.93	0.25	5.00	4.00
TruePosition_BD1_TP2	4.87	0.34	5.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with Error < Uncertainty	Percentage of calls Error < Uncertainty
TruePosition_BD1_TP1	104	92	88.46%
TruePosition_BD1_TP2	100	91	91.00%





Building 1- Hybrid UTDOA-AGPS Location Scatter

2.2 Building 2:

2.2.1 Building 2 Environment:

Building 2 is the Hilton Hotel located at 100 Continental Drive in Newark, DE. It is a 4 story brick building.



As seen in the Google Earth images in this section, Building 2 is located in a suburban industrial area neighboring similarly sized buildings. A significant amount of space between buildings is a characteristic of this suburban area.



2.2.2 Building 2 Test Points:

TP1: 1st floor corridor toward the back of the building

TP2: 1st floor Restaurant Area

TP3: 1st floor, front side of the building close to second entrance

TP4: 2nd floor guest room

TP5: 3rd floor guest room

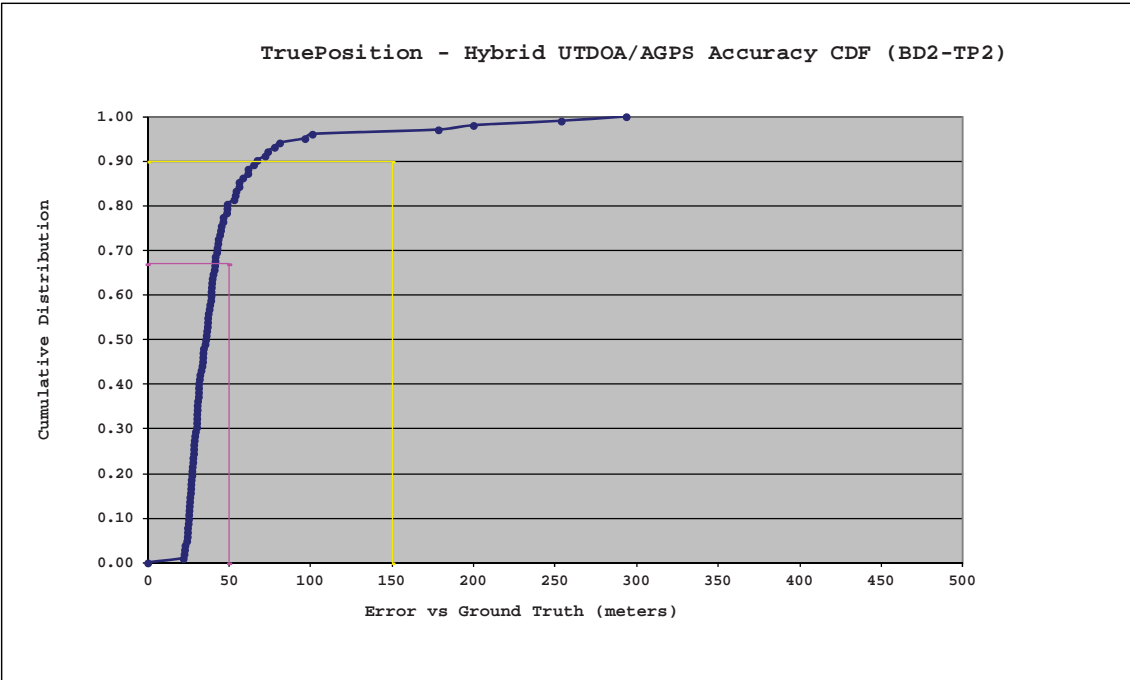
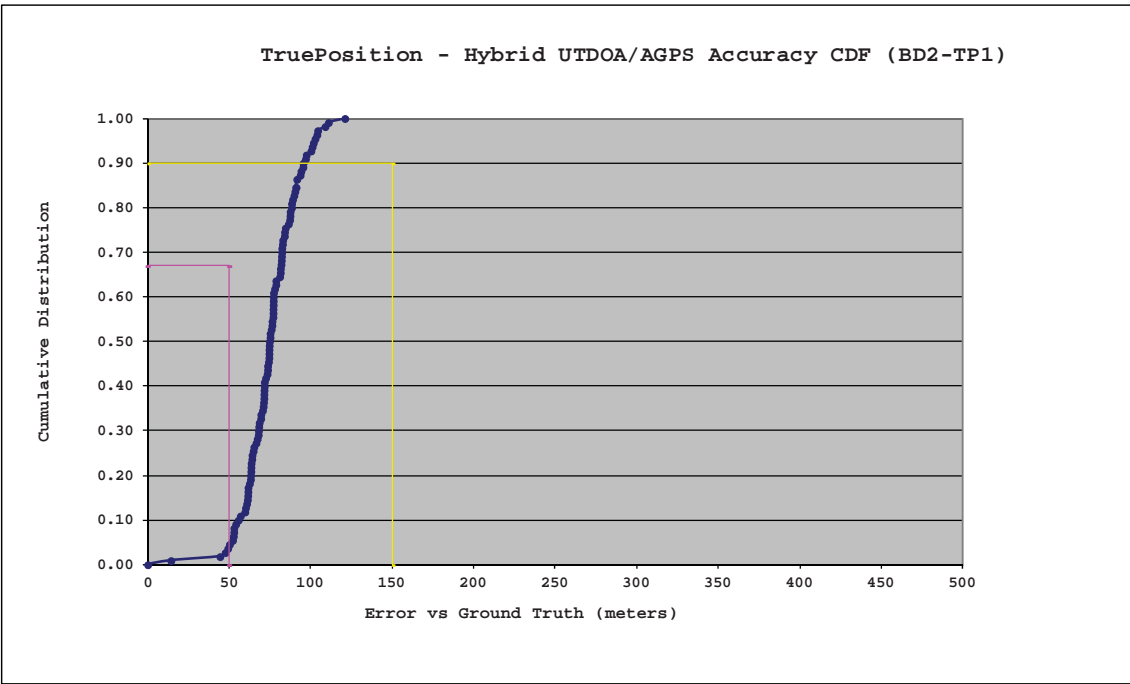
2.2.3 Building 2 Test Results:

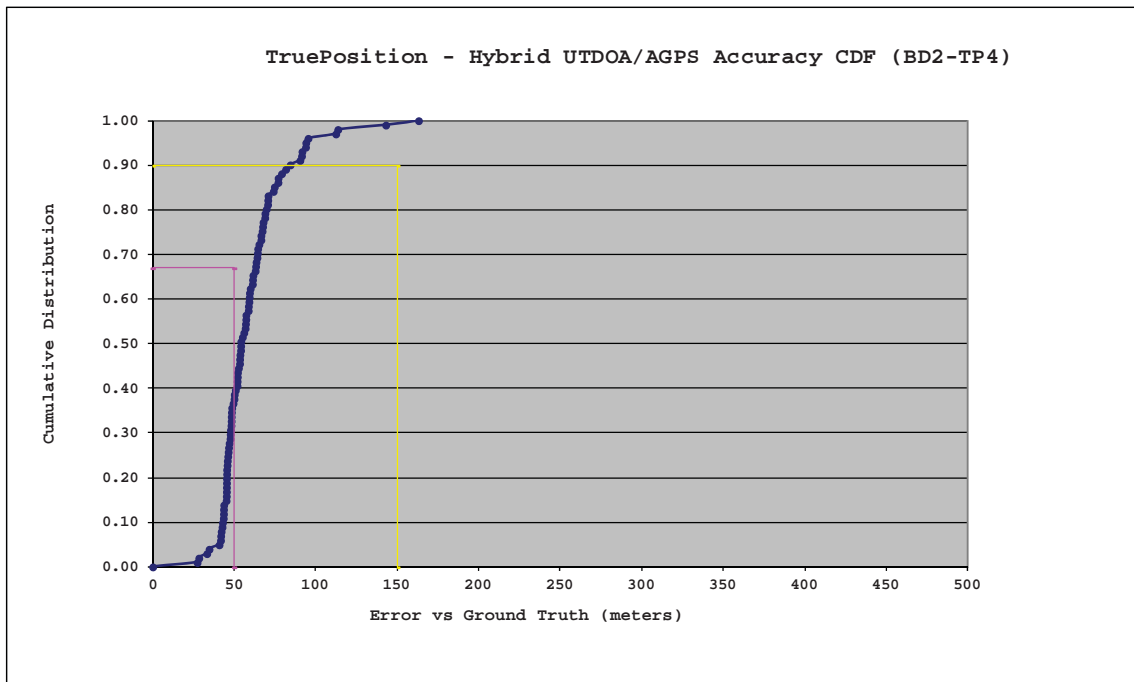
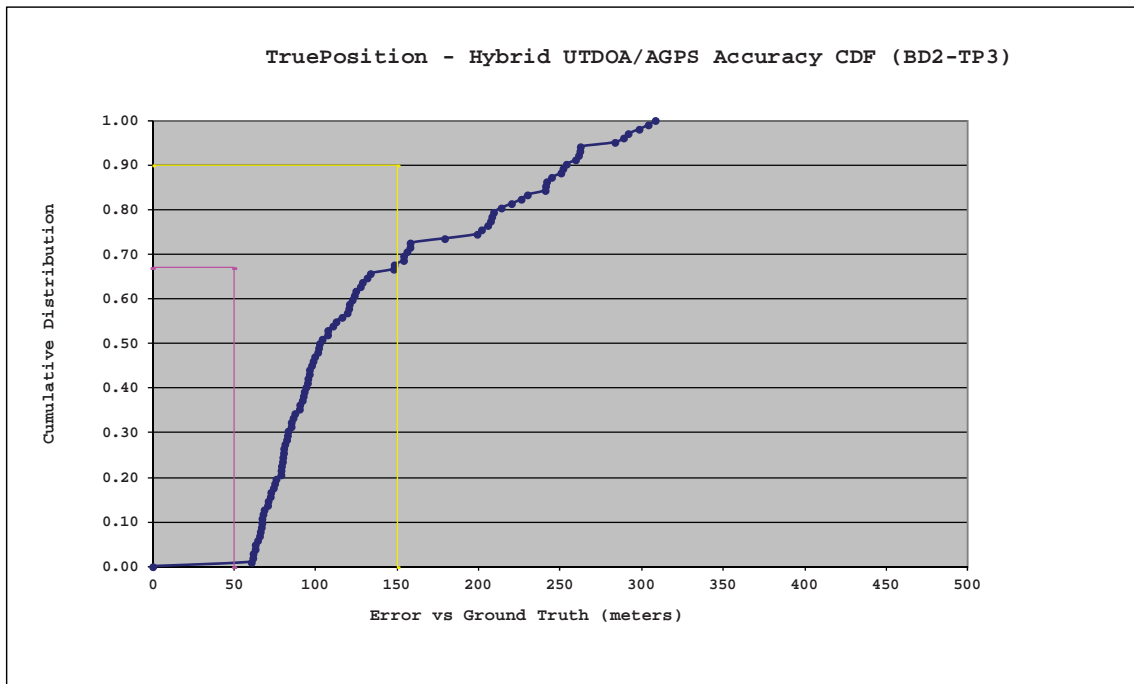
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD2_TP1	110	110	100.0%
TruePosition_BD2_TP2	102	102	100.0%
TruePosition_BD2_TP3	102	102	100.0%
TruePosition_BD2_TP4	101	101	100.0%
TruePosition_BD2_TP5	104	104	100.0%

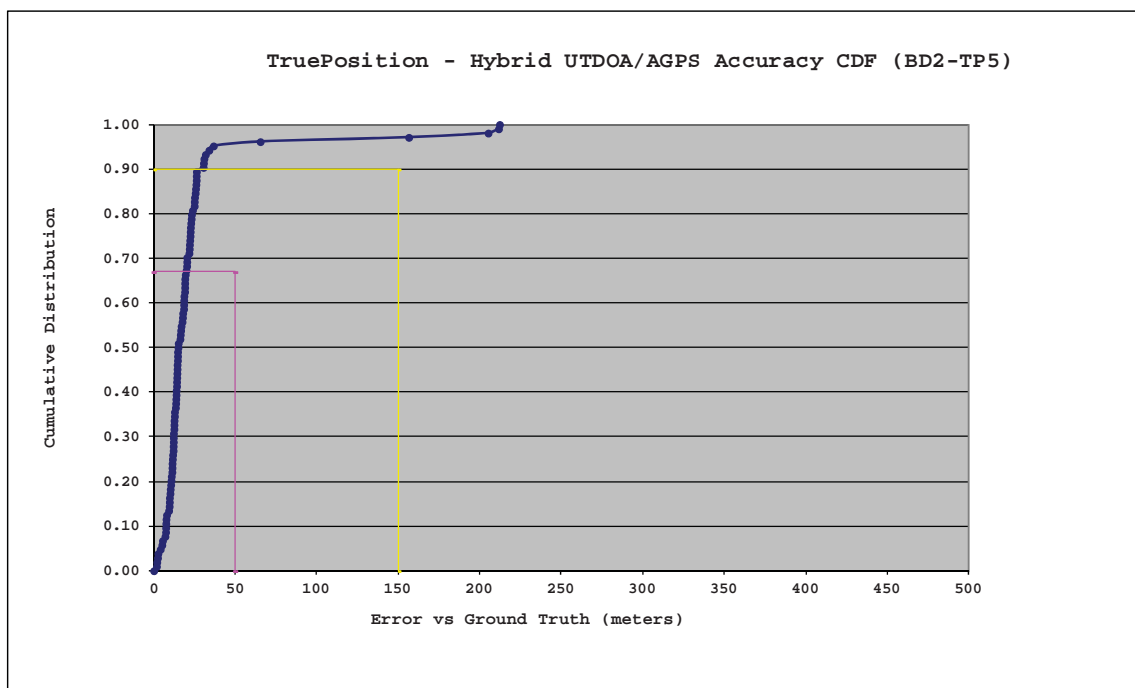
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD2_TP1	110	81.8	95.5	102.1	75.6	15.9	120.9	14.21
TruePosition_BD2_TP2	102	41.2	66.8	95.6	46.5	41.5	293.4	21.78
TruePosition_BD2_TP3	102	148.0	253.4	282.3	136.6	72.7	308.1	60.48
TruePosition_BD2_TP4	101	63.1	84.3	93.9	60.1	21.1	163.0	27.25
TruePosition_BD2_TP5	104	19.9	29.1	36.2	23.6	36.0	212.0	1.69

UTDOA TTFF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD2_TP1	4.67	0.47	5.00	4.00
TruePosition_BD2_TP2	4.86	0.37	6.00	4.00
TruePosition_BD2_TP3	4.96	0.20	5.00	4.00
TruePosition_BD2_TP4	4.92	0.27	5.00	4.00
TruePosition_BD2_TP5	4.84	0.37	5.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with	Percentage of calls Error < Uncertainty
		Error < Uncertainty	
TruePosition_BD2_TP1	110	62	56.36%
TruePosition_BD2_TP2	102	71	69.61%
TruePosition_BD2_TP3	102	36	35.29%
TruePosition_BD2_TP4	101	52	51.49%
TruePosition_BD2_TP5	104	72	69.23%







Building 2- Hybrid UTDOA-AGPS Location Scatter

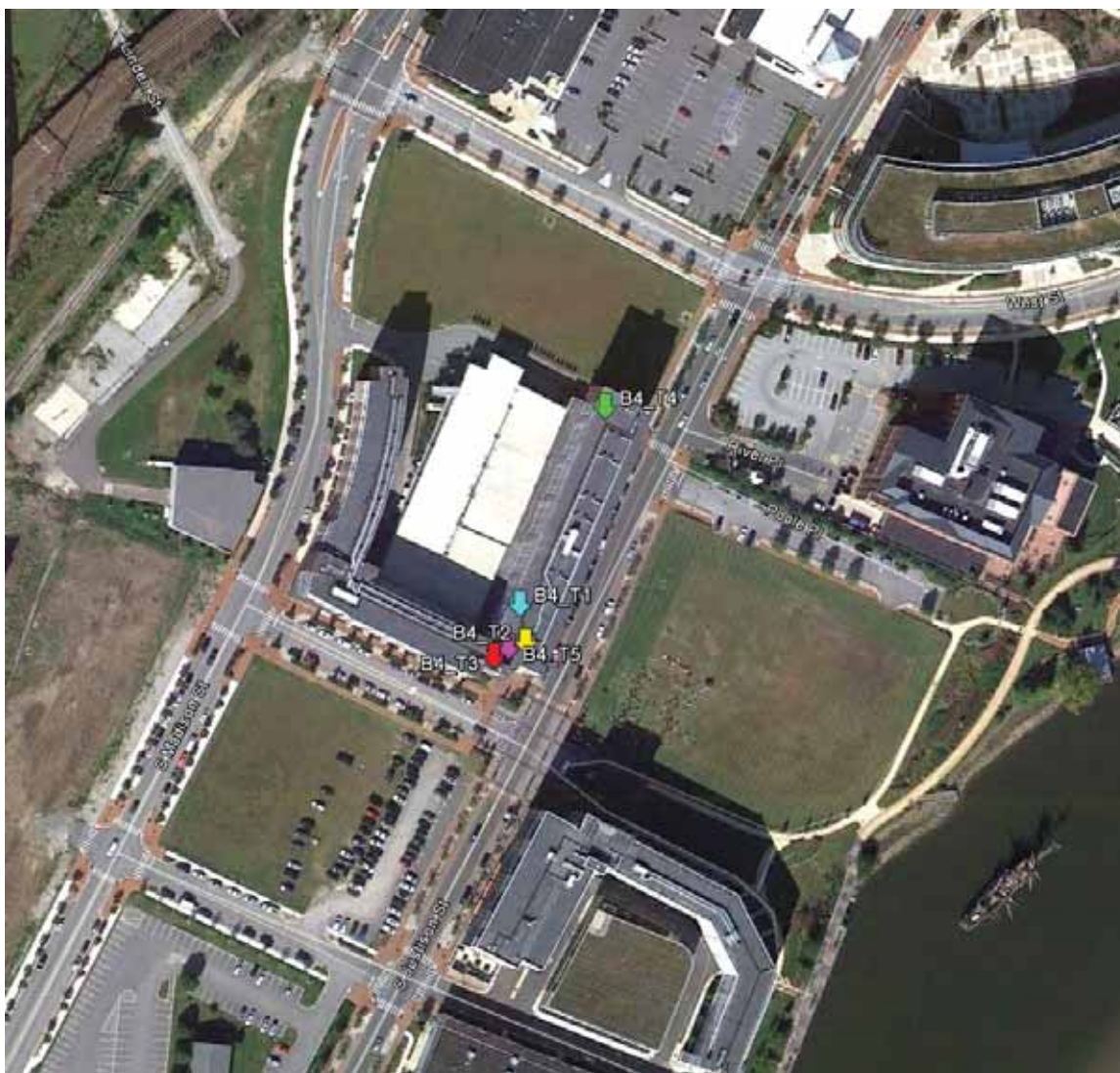
2.3 Building 4:

2.3.1 Building 4 Environment:

Building 4, Justison Landing, is a seven story concrete and brick building that forms a U shape around a parking structure. It is located at 331 Justison Street in Wilmington, DE.



As seen in the Google Earth aerial view, Building 4 has open space around it along with similar structures.



2.3.2 Building 4 Test Points:

TP1: 2nd floor apartment kitchen facing parking structure

TP2: 6th floor corridor

TP3: 6th floor apartment

TP4: 4th floor freight elevator lobby

TP5: 1st floor entry lobby close to the reception area

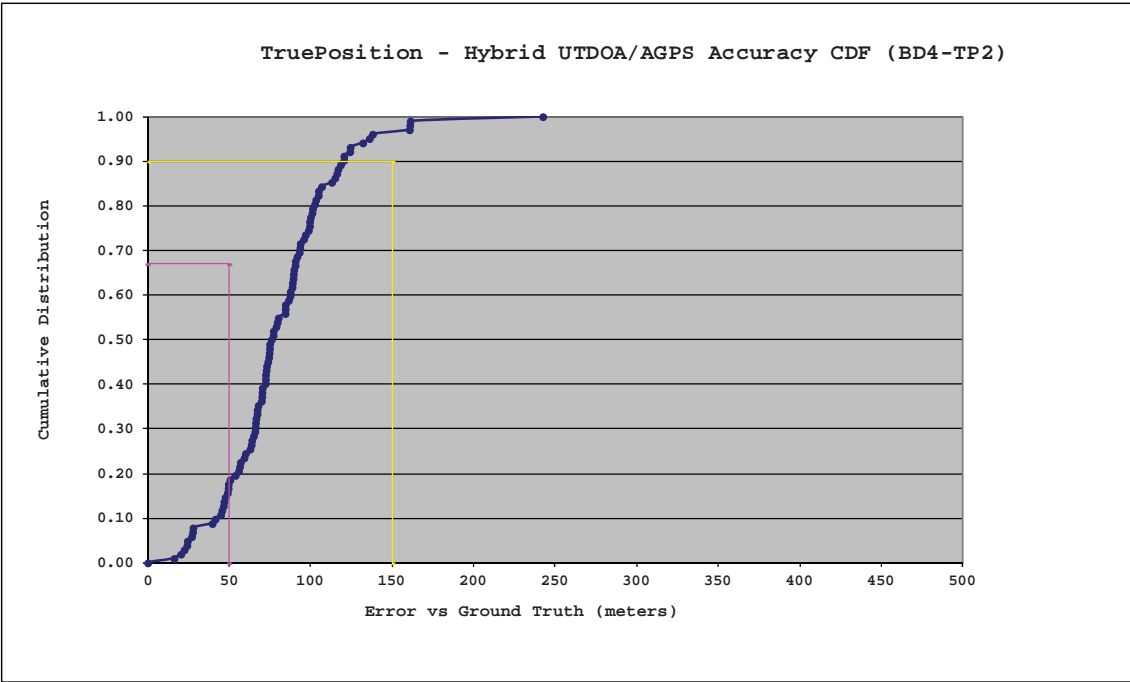
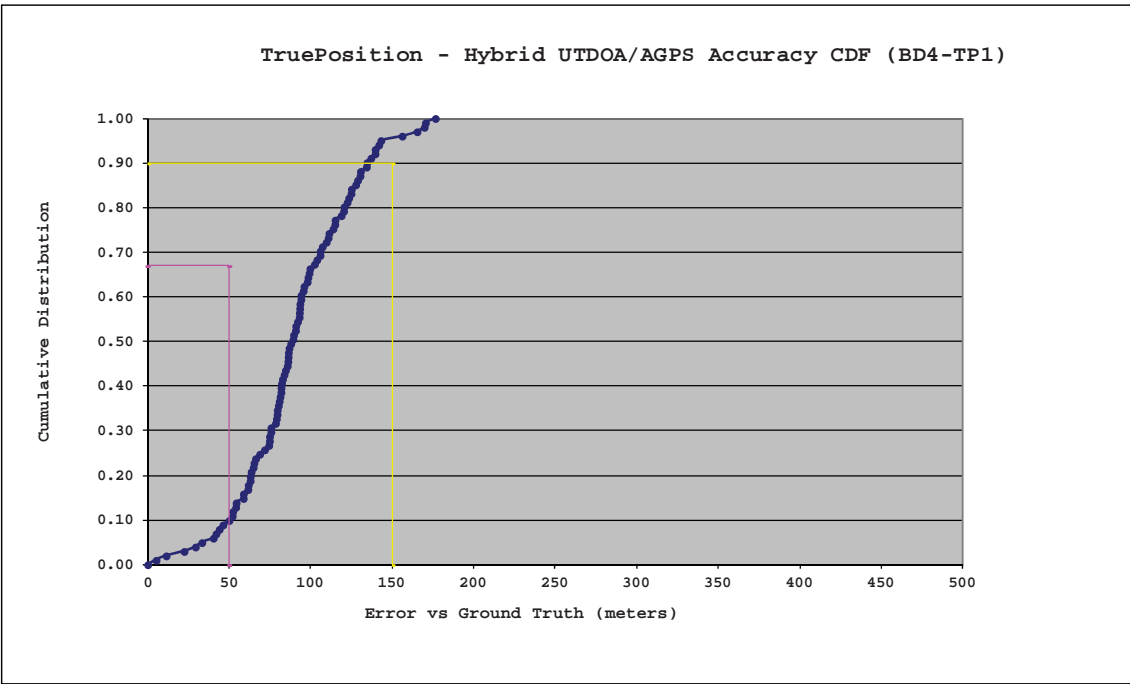
2.3.3 Building 4 Test Results:

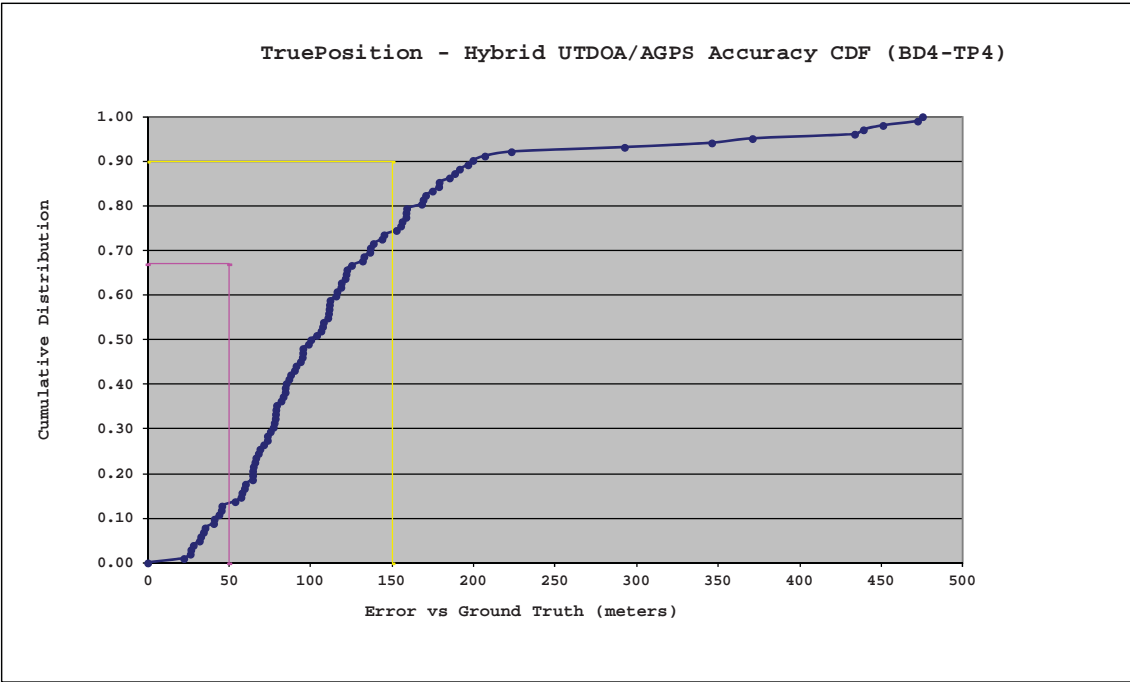
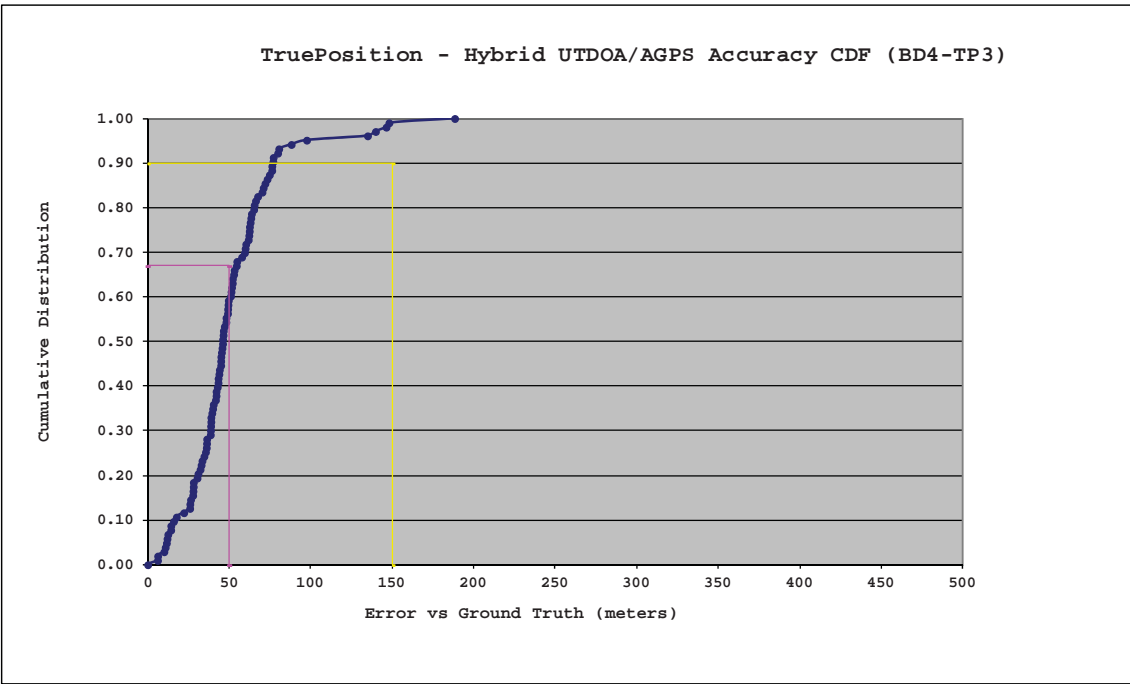
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD4_TP1	101	101	100.0%
TruePosition_BD4_TP2	102	102	100.0%
TruePosition_BD4_TP3	103	103	100.0%
TruePosition_BD4_TP4	102	102	100.0%
TruePosition_BD4_TP5	102	102	100.0%

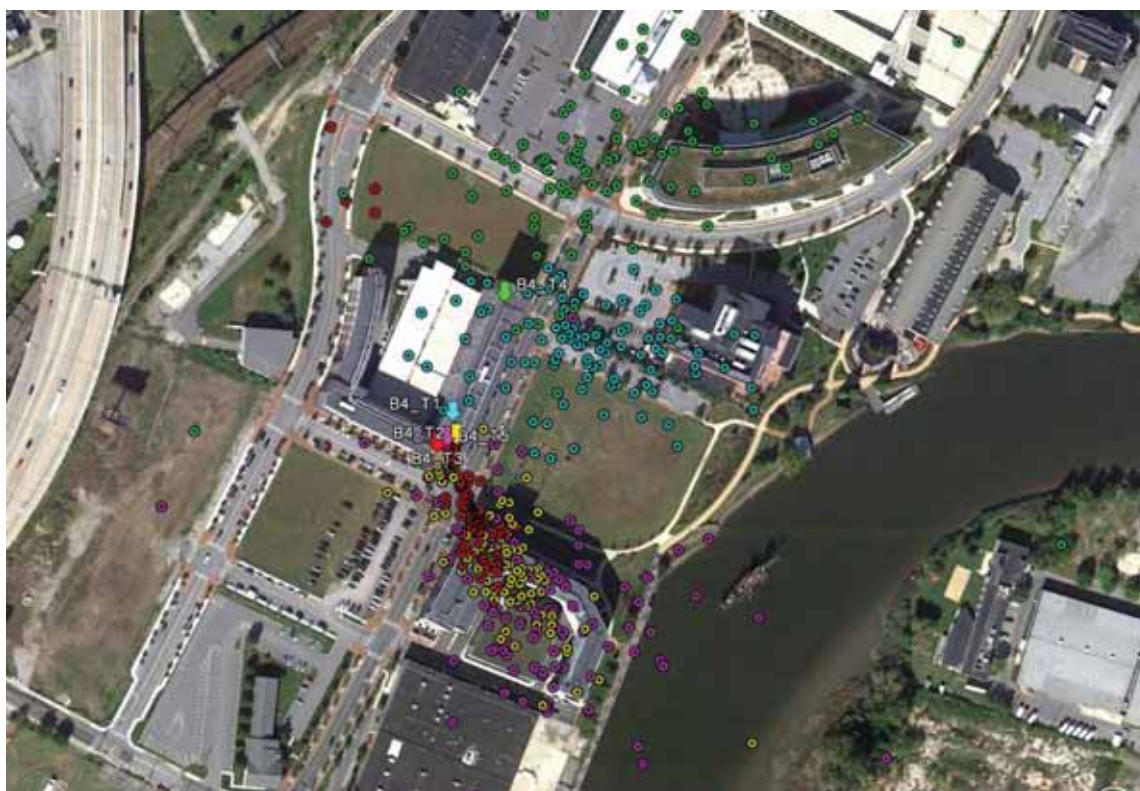
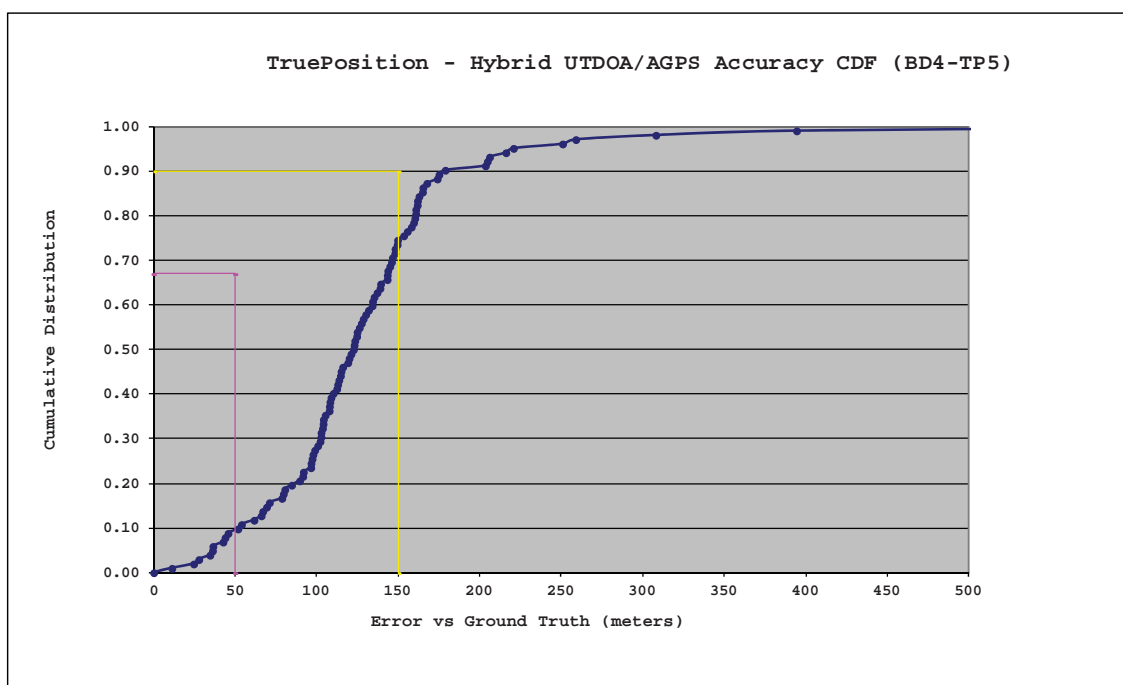
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD4_TP1	101	102.2	134.4	143.0	91.3	34.1	176.4	5.15
TruePosition_BD4_TP2	102	90.5	120.1	135.7	81.0	34.5	242.2	16.12
TruePosition_BD4_TP3	103	54.5	76.7	96.5	51.1	29.9	188.2	6.04
TruePosition_BD4_TP4	102	129.5	199.1	369.5	126.7	96.6	475.1	22.13
TruePosition_BD4_TP5	102	143.4	178.4	220.4	131.6	85.9	771.9	11.16

UTDOA TTF (Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD4_TP1	4.86	0.35	5.00	4.00
TruePosition_BD4_TP2	4.91	0.29	5.00	4.00
TruePosition_BD4_TP3	4.94	0.24	5.00	4.00
TruePosition_BD4_TP4	4.87	0.36	6.00	4.00
TruePosition_BD4_TP5	4.83	0.37	5.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with	Percentage of calls Error < Uncertainty
		Error < Uncertainty	
TruePosition_BD4_TP1	101	97	96.04%
TruePosition_BD4_TP2	102	77	75.49%
TruePosition_BD4_TP3	103	98	95.15%
TruePosition_BD4_TP4	102	78	76.47%
TruePosition_BD4_TP5	102	65	63.73%







Building 4- Hybrid UTD OA-AGPS Location Scatter

2.4 Building 8:

2.4.1 Building 8 Environment:

Building 8 is the “Iron Hill” building at 700 Prides Crossings, Newark, DE in Wilmington, DE. It is a 3 story concrete building covering a full street block.



As seen in the Google Earth aerial view, Building 8 has two wings with an atrium in between. The building is in a suburban industrial/residential area. Neighboring buildings include three short structures as well as townhomes.



2.4.2 Building 8 Test Points:

- TP1: 3rd floor Facilities office conference room
- TP2: 3rd floor common hallway
- TP3: 1st floor north stair tower lobby near atrium
- TP4: 1st floor inside office
- TP5: 1st floor exterior office

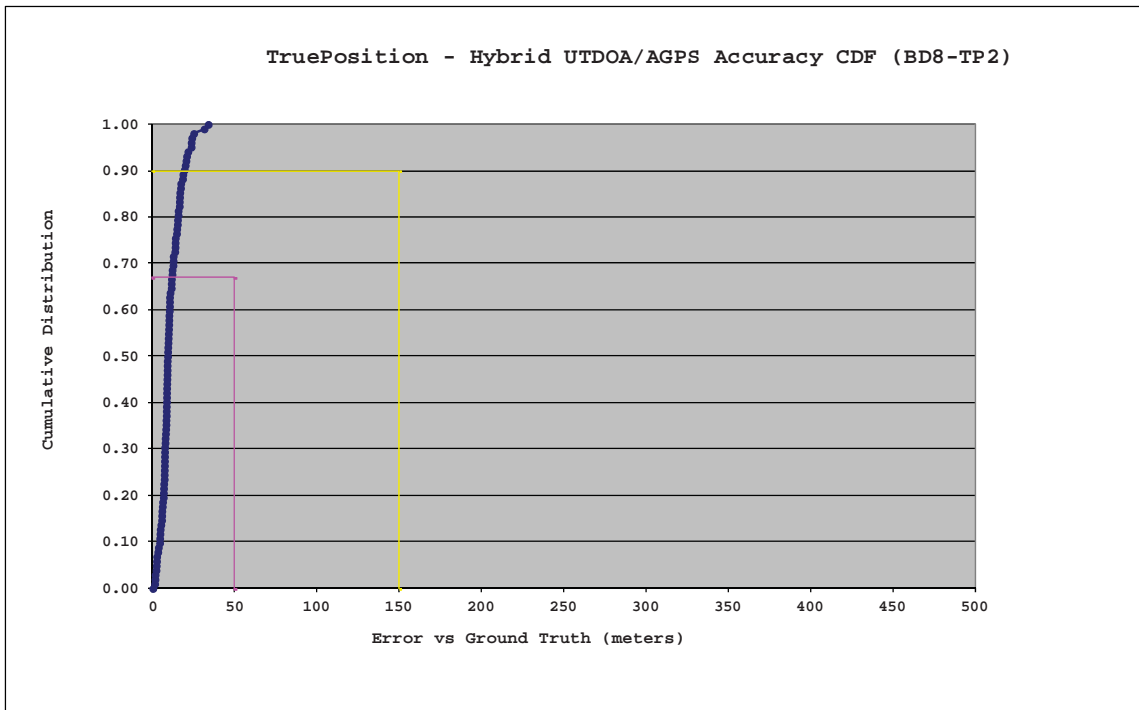
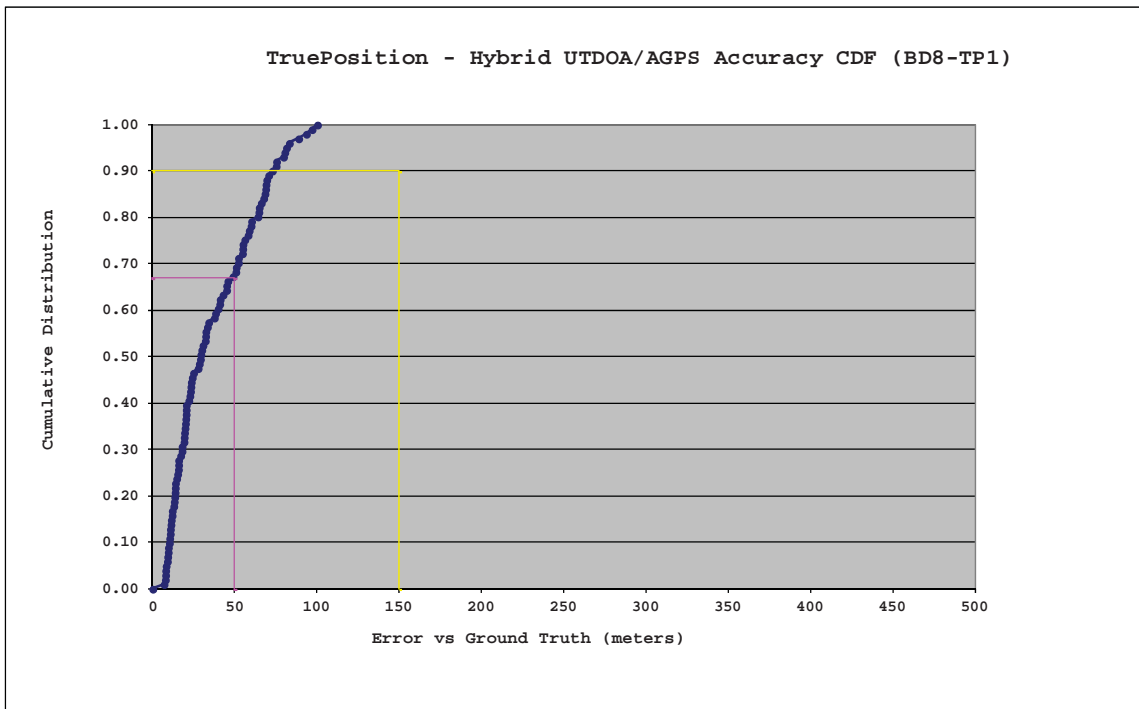
2.4.3 Building 8 Test Results:

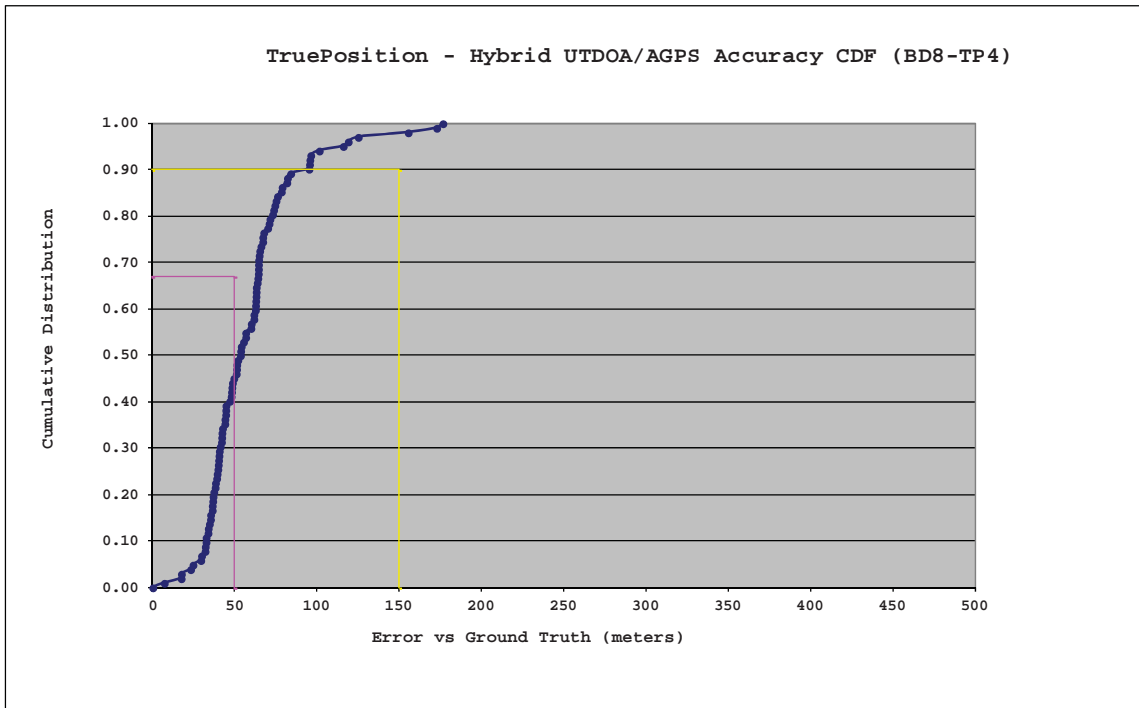
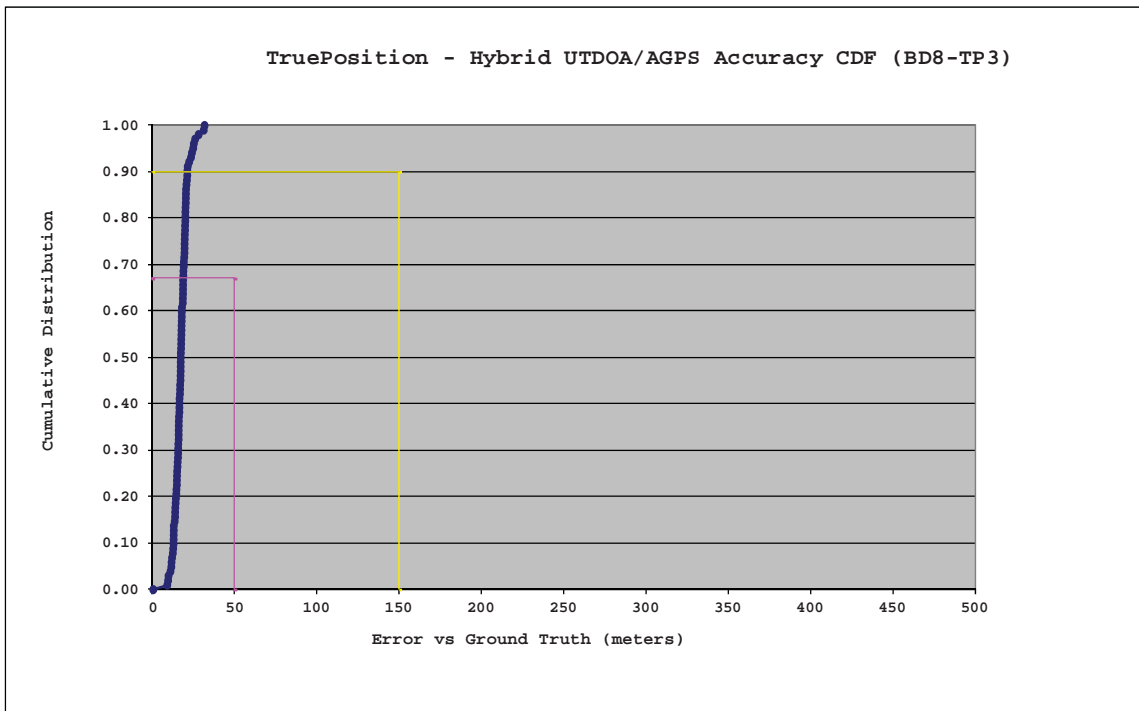
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD8_TP1	101	101	100.0%
TruePosition_BD8_TP2	102	102	100.0%
TruePosition_BD8_TP3	102	102	100.0%
TruePosition_BD8_TP4	102	102	100.0%
TruePosition_BD8_TP5	102	102	100.0%

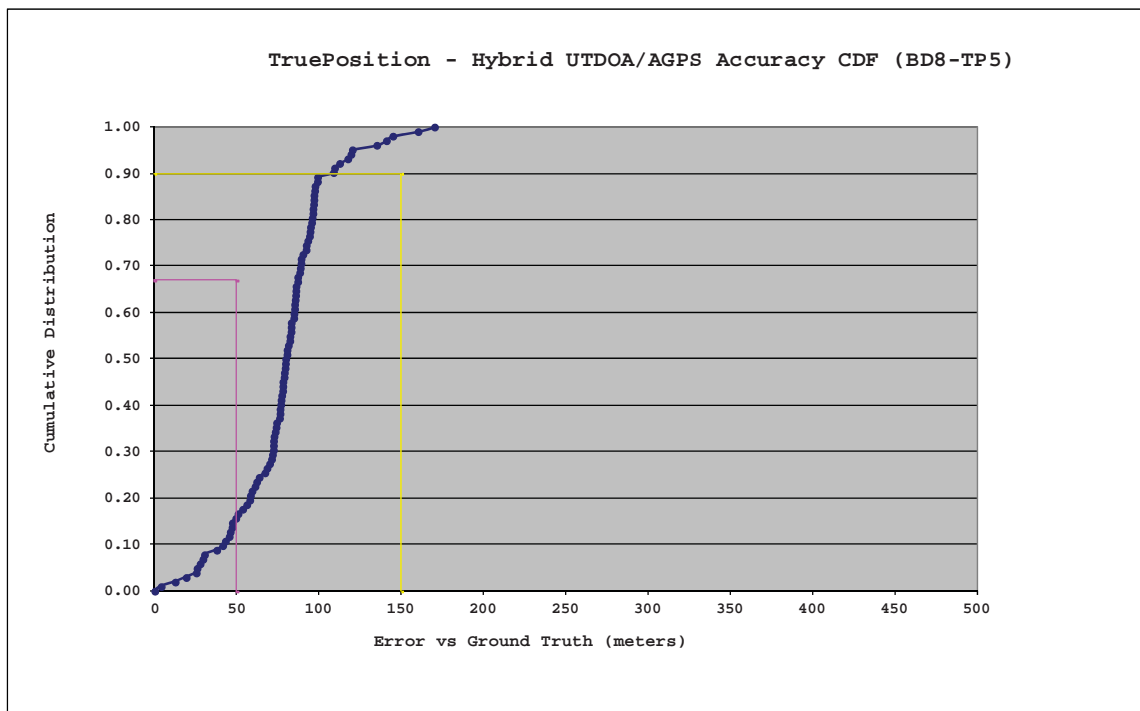
UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD8_TP1	101	48.8	72.7	81.3	37.0	25.1	100.1	6.85
TruePosition_BD8_TP2	102	11.6	19.0	23.2	10.7	6.2	33.7	1.13
TruePosition_BD8_TP3	102	18.2	20.7	24.2	17.0	4.0	31.2	8.50
TruePosition_BD8_TP4	102	64.0	93.8	115.0	58.5	29.0	176.3	6.99
TruePosition_BD8_TP5	102	86.9	107.6	120.0	78.5	28.3	170.0	3.88

UTDOA TTF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD8_TP1	4.95	0.22	5.00	4.00
TruePosition_BD8_TP2	5.13	2.22	27.00	4.00
TruePosition_BD8_TP3	4.90	0.30	5.00	4.00
TruePosition_BD8_TP4	4.78	0.41	5.00	4.00
TruePosition_BD8_TP5	4.83	2.18	26.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with	Percentage of calls Error < Uncertainty
		Error < Uncertainty	
TruePosition_BD8_TP1	101	94	93.07%
TruePosition_BD8_TP2	102	93	91.18%
TruePosition_BD8_TP3	102	100	98.04%
TruePosition_BD8_TP4	102	53	51.96%
TruePosition_BD8_TP5	102	35	34.31%







Building 8- Hybrid UTDOA-AGPS Location Scatter

2.5 Building 10:

2.5.1 Building 10 Environment:

Building 10 is a brick two story office building located in the suburbs of Wilmington at 801 Brandywine.



The Google Earth aerial view shows that the building is in a suburban area surrounded by one and two story buildings and homes.



2.5.2 Building 10 Test Points:

TP1: 2nd floor side office room

TP2: 1st floor office area

TP3: Basement

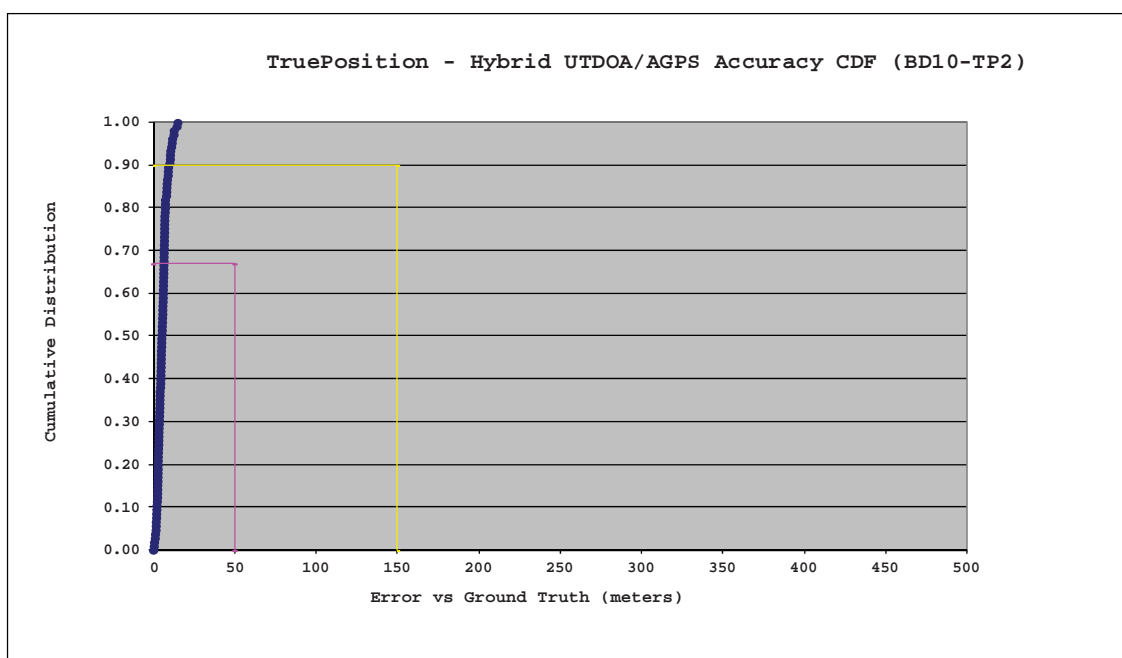
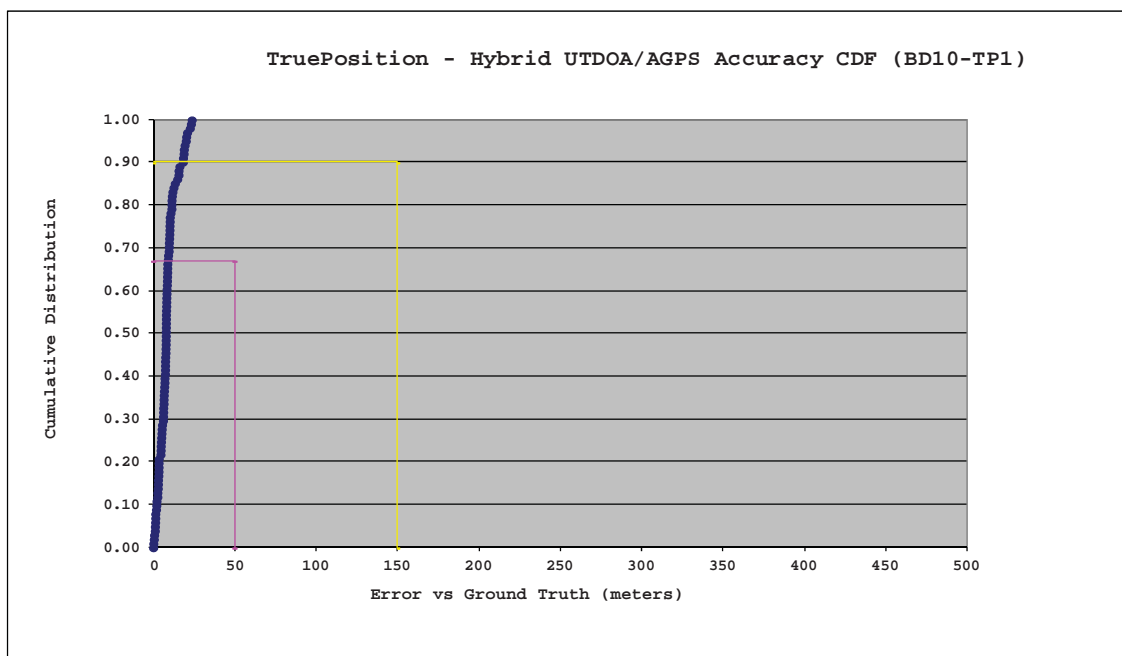
2.5.3 Building 10 Test Results:

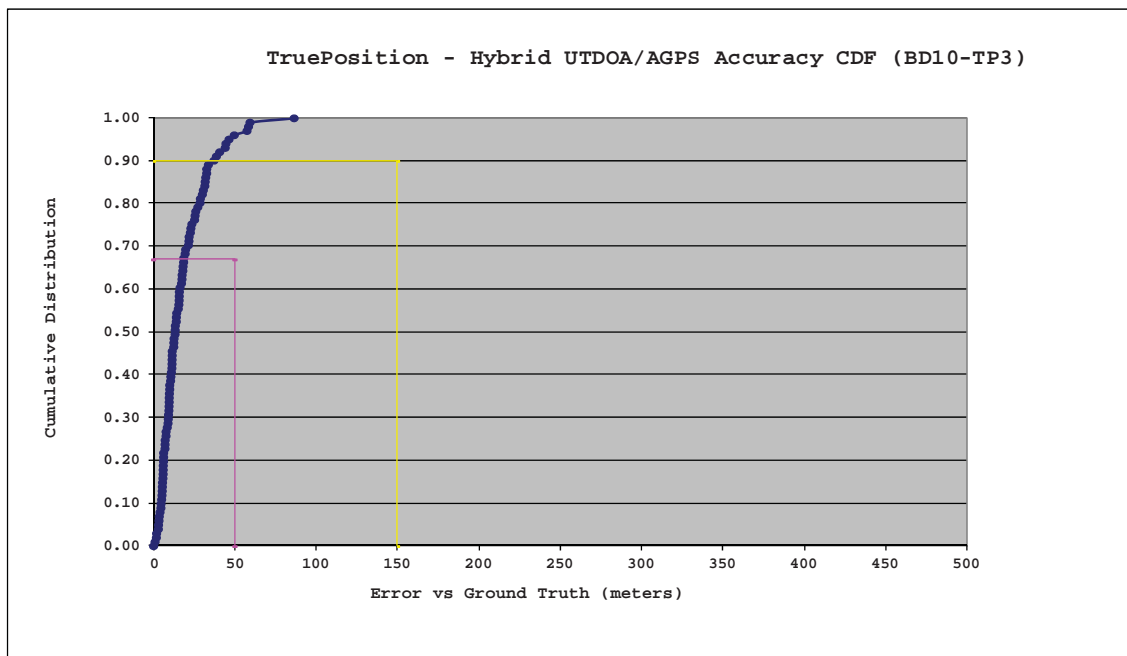
Number of Test Calls and Yield			
Test Point ID	Total Number of Test Calls Attempted	Total Number of Test Calls with Position Fix Received	Percentage of Test Calls with Fix Received (Yield)
TruePosition_BD10_TP1	101	101	100.0%
TruePosition_BD10_TP2	105	105	100.0%
TruePosition_BD10_TP3	101	101	100.0%

UTDOA/AGPS Weighted Hybrid - Location Error Statistics (m)								
Test Point ID	Total Number of Calls	67 th	90 th	95 th	Average Error	Standard	Max Error	Min Error
		Percentile	Percentile	Percentile		Deviation		
TruePosition_BD10_TP1	101	9.0	18.2	20.1	8.5	5.4	23.7	0.12
TruePosition_BD10_TP2	105	6.4	9.7	11.4	5.5	3.0	15.0	0.38
TruePosition_BD10_TP3	101	18.6	37.1	46.4	18.0	14.9	86.4	0.87

UTDOA TTFF(Sec)				
Test Point ID	Average Duration	Standard	Max Duration	Min Duration
		Deviation		
TruePosition_BD10_TP1	4.56	0.50	5.00	4.00
TruePosition_BD10_TP2	4.99	0.10	5.00	4.00
TruePosition_BD10_TP3	4.95	0.41	7.00	4.00

UTDOA/AGPS Weighted Hybrid Uncertainty			
Test Point ID	Total Test Calls	Number of calls with Error < Uncertainty	Percentage of calls Error < Uncertainty
TruePosition_BD10_TP1	101	80	79.21%
TruePosition_BD10_TP2	105	105	100.00%
TruePosition_BD10_TP3	101	101	100.00%





Building 10- Hybrid UTDOA-AGPS Location Scatter